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CALCIUM NEED AND CALCIUM UTILIZATION

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NEW YORK

In 1911, Sherman [1] called attention to the calcium deficiency of the average American dietary. Again, after twenty years, he [2] stated that "probably a larger proportion of the ordinary dietaries, both of adults and of children, can be improved by enrichment in calcium than in any other one chemical element."

It seems surprising, in view of the study and attention given in recent years to the subject of dietary needs, that such a calcium deficiency still exists. Yet, on further consideration, the reason for it may well be attributed to a prevailing opinion which holds that bread is "the staff of life" and the ordinary "mixed meal" represents a sufficient diet. This assurance is supported by Peters and Van Slyke [3] in a recent publication, in which is found the statement that "under ordinary circumstances, of course, normal adults live in a state of calcium equilibrium, the daily loss being equal to the intake."

Information concerning calcium need, supply, utilization, and the forms in which it occurs in the body has been well presented by the work of Sherman, Orgler,[4] Bergeim,[5] Klinke,[6] Aub [7] and others. Enough data are available to show that, contrary to the general belief, the existence of optimum conditions in regard to calcium cannot be taken for granted but that special effort is necessary to assure adequate supply and utilization of this element.

CALCIUM REQUIREMENT

Sherman states that 0.45 Gm. of calcium (0.63 Gm. of calcium oxide) fills the actual daily requirement for adults, but this represents the minimum of actual need rather than the normal allowance. He considers that the normal, or "standard," allowance for protein, phosphorus and iron in the diet should be set 50 per cent above the average minimum, while for calcium the margin for safety should be even greater than this, because of the uncertainties in regard to calcium absorption. He estimates the optimum allowance to be 0.70 Gm. of calcium (1.0 Gm. of calcium oxide), and his figures are widely accepted.

By a whole series of criteria, Sherman was able to show the beneficial influence of increased calcium (and vitamin G) through an additional amount of milk in the food mixture of families of rats thriving in the twenty-seventh generation on adequate uniform diet. He noted more rapid and efficient growth, lower death rates, and higher vitality at all ages, an increase of 10 per cent in the average longevity of adults, and greater extension of the prime of life, in that maturity was expedited and senility deferred in the same individual.

His conclusions are interesting. He says:

> As there has been so strong a tendency to attribute longevity entirely to hereditary factors, it may be worth while to emphasize the fact that here in parallel groups of exactly the same heredity the influence of food on longevity is demonstrated with such degree of mathematical certainty as is represented by "chances" much better than 10,000: 1, or with a hundredfold greater certainty than is usually considered necessary for the conclusive establishment of such scientific observations.

He believes that a number of weaknesses and increased susceptibilities to infection may be the results of calcium deficiency. He holds that the difference between a merely average and a better-than-average nutritional condition has a real significance for the maintenance of health or for recovery from disease.

Unfortunately, it is not so easy to conduct such clear-cut experiments on the human subject as those performed by Sherman on rats.

Inquiry into the dietary histories of more than 4,000 patients (unselected cases) in the New York Hospital revealed only two whose diets were adequate in calcium, and both of these were in the hospital because of injuries through accident and not because of disease.

If the same number of apparently healthy persons should be thus questioned, a very similar calcium deficiency might well be disclosed. But who can say that in these apparently normal people general health and longevity have attained their optimum biologic possibilities? Obviously, too many ailments occur in middle life, and people die too young.

Persons differ markedly in their adaptabilities. Some may respond to insufficient supply of essential elements in terms of frank disease, depending on their points of least resistance; others may maintain themselves in the manner of Sherman's rats, before the addition of milk to their diet—seemingly normal, but really considerably below their potentialities for full health and long life.

A large supply of calcium is present in the bones, and this store can be drawn on over a considerable period of time to substitute for a dietary lack without pro-

From the Department of Metabolism and Clinical Research, New York Hospital, and the Department of Medicine, Cornell University Medical College.

1. Sherman, H. C.: Chemistry of Food and Nutrition, New York, Macmillan Company, 1911, p. 289.
2. Sherman, H. C.: Some Recent Advances in the Chemistry of Nutrition, J. A. M. A. **97**: 1425 (Nov. 14) 1931.
3. Peters, J. P., and Van Slyke, D. D.: Quantitative Clinical Chemistry (Interpretations), Baltimore, Williams & Wilkins Company, 1931, p. 806.
4. Orgler, A. L.: Der Kalkstoffwechsel des gesunden u. des rachitischen Kindes, Ergebn. d. inn. Med. u. Kinderh. **8**:142, 1912.
5. Bergeim, Olaf: Intestinal Chemistry, J. Biol. Chem. **70**: 35 (Sept.) 1926.
6. Klinke, Karl: Zustandsform des Serumcalciums und ihre Pathologische Bedeutung, Klin. Wchnschr. **6**: 791 (April 23) 1927.
7. Bauer, Walter, and Aub, J. C.: Studies of Inorganic Salt Metabolism, J. Am. Dietetic A. **3**: 106 (Sept.) 1927.

ducing obvious osteoporosis or a reduced calcium content of the blood. It is, however, entirely possible that the calcium depletion of the bones in old age, which is considered a normal manifestation, may be but the result of a prolonged insufficiency in the calcium intake.

Like Sherman's results with rats, it has been my experience with normal persons that a sustaining diet enriched by the addition of calcium and vitamins makes for the difference between "passable" and "buoyant" health. And, furthermore, the marked improvement seen with the use of a high calcium regimen in the treatment of a number of apparently unrelated disorders corroborates Sherman's opinion of the advantages of an adequate calcium diet in the recovery from disease.

From the study of these cases, the importance of calcium in human nutrition and health seems far greater than is now commonly realized. Reports of this investigation will be given in another communication. The purpose at present is to consider how the adequate supply and utilization of calcium may be attained, accepting 0.70 Gm. as the optimum daily requirement. To this end three main considerations are essential:

1. Its sources of supply.
2. The proper preparation of food in order to conserve the calcium content.
3. The factors that govern its absorption.

CALCIUM SUPPLY

Sources of calcium supply are food, water and calcium salts, as such. Meats and fish are known to be poor in calcium content, but the portions of fruits, vegetables and dairy products included in the ordinary diet are thought to be adequate sources of supply.

TABLE 1.—*Foods with Their Calcium Equivalents* *

Milk	1.5 pounds (3-4 glasses)	Good sources of calcium
Cheese	0.25 pound	
Apples	20.2 pounds (50 large apples)	Erroneously considered good sources of calcium
Beans (string)	3.2 pounds	
Beets	9.4 pounds	
Bread (white)	7.3 pounds	
Bread (brown)	5.5 pounds	
Butter	11.0 pounds	
Cabbage	3.9 pounds	
Carrots	3.7 pounds	
Cauliflower	1.5 pounds	
Celery	2.7 pounds	
Corn (green)	27.5 pounds	
Eggs	2.6 (20 eggs)	
Grapefruit	7.3 pounds	
Grapes	12.0 pounds	
Lentils	1.8 pounds	
Oatmeal	2.3 pounds	
Oranges	4.9 pounds	
Pears	12.9 pounds	
Peas (green)	9.9 pounds	
Potatoes	17.0 pounds	
Rice	17.6 pounds	
Tomatoes	11.0 pounds	
Watermelon	26.4 pounds	
Meat (lean beef)	26.4 pounds	Poor sources of calcium
Fish	14.7 pounds	
Water (Catskill and Croton)	100 quarts	

* Figures calculated from Sherman's tables.

It is of interest to examine some of these supposedly calcium rich substances to see what amounts will furnish the calcium requirement. Table 1 gives a list of some of the common foods, the quantity of each, as indicated, containing the calcium requirement for one day: 0.70 Gm. of calcium (1.0 Gm. of calcium oxide).

It is obvious that unless milk or cheese is included in the diet it would be exceedingly difficult to fill the calcium need, since inordinately large amounts of other foods and water would have to be ingested, quantities far beyond the capacity of the normal individual. Thus, for example, if the needed calcium were to be obtained from white bread alone, it would be necessary to eat more than seven loaves; if from potatoes, seventeen pounds; if from butter (a dairy product), eleven pounds; and if from apples, fifty large ones. Whereas, about one quart of milk or one-fourth pound of cheese will supply the necessary calcium.

LOSS OF CALCIUM (AND OTHER SALTS) IN COOKING

The poor supply of calcium furnished by vegetables and fruits is made still more meager through the method of cooking in common use. Vegetables are, for the most part, cooked in large quantities of water. Considerable amounts of the calcium and other salts are retained in the water, which is usually discarded. In restaurants, in America, the water containing the salts is frequently added to soups, but it is lost so far as the vegetables are concerned. Answers to questions addressed to a large number of housewives and cooks, over a period of more than five years, concerning their methods of preparing vegetables, show that only about 1 per cent of them use the water in which the vegetables are cooked. Sherman and Hawley [8] and McClugage and Mendel [9] showed that calcium is better absorbed from milk than from vegetables; another factor which makes vegetables a poor source of calcium supply.

In spite of widespread attention given to dietary needs in newspapers, magazines and health centers, the vast majority of people in America still cook the way they have always cooked. Physicians all too infrequently concern themselves with dietary requirements.

TABLE 2.—*Essential Factors in Calcium Metabolism*

Intake:
- Food
- Water
- Calcium salts (as such)

Absorption: Through the intestines, regulated by:
1. p_H within the intestine: salts are absorbed in proportion to their relative solubilities
   - Acid p_H 3.0-6.9: calcium salts are soluble in acid solutions
   - Neutral p_H 7.0
   - Alkaline p_H 7.8-9.8: intestinal, pancreatic, biliary secretions calcium salts are insoluble in alkaline solutions
2. Other substances in the diet
   - (a) Excessive fats: calcium soaps of fatty acids are not absorbed
   - (b) Excess of phosphates: tertiary calcium phosphate is insoluble
   - (c) Oxalic acid (in leafy vegetables): calcium oxalate is insoluble
   - (d) Lactose in fairly large amounts promotes absorption

Blood:

Total calcium content (average normal) = 10 mg. per 100 cc.

1. Nondiffusible (bound to protein) = 5 mg.
2. Diffusible
   - (a) Ionic = 2 mg.
   - (b) Complex ionic = 3 mg.

Relative concentration of these forms is determined by
1. Parathyroid glands
2. Vitamin D
3. Amount of blood protein
4. The acid base equilibrium
5. Amount of phosphorus

Nondiffusible calcium varies directly with the blood protein
Diffusible calcium increases with decrease in p_H
Concentration of calcium is inversely proportional to that of phosphorus

Bone:
Calcium = 66 per cent by weight
1. Shafts ⟷ blood
2. Trabeculae ⟷ blood

Excretion:
1. Feces (70 per cent)
2. Urine (30 per cent)

On low calcium diets a continuous negative balance occurs

Calcium intake	300 mg. (approximately)
Calcium output	790 mg.
Feces	600 mg.
Urine	190 mg.
Negative balance	490 mg.

8. Sherman, H. C., and Hawley, Edith: Calcium and Phosphorus Metabolism in Childhood, J. Biol. Chem. **53**: 375 (Aug.) 1922.
9. McClugage, H. B., and Mendel, L. B.: Experiments on the Utilization of Nitrogen, Calcium and Magnesium in Diets Containing Carrots and Spinach, J. Biol. Chem. **35**: 355 (Aug.) 1918.

Undoubtedly, much could be done to insure the utilization of the mineral content of food, if advice concerning its preparation came directly from the physician.

Table 2 gives an outline of the essential factors in calcium metabolism.

CALCIUM ABSORPTION

Calcium is absorbed through the small intestine and the degree of absorption is governed by two main factors: (1) the hydrogen ion concentration within the intestine; (2) the relative proportion of other substances in the diet. Some investigators are of the opinion that vitamin D exerts an influence on the absorption of calcium. This matter, however, is not yet settled, since recent work tends to show that its effect is not so much on absorption as on the intermediary metabolism of calcium.

Hydrogen Ion Concentration.—Solubility is essential for absorption. Insoluble calcium salts are formed in an alkaline medium and are thus not absorbable, whereas in an acid medium they are soluble and can be absorbed. Measures that promote intra-intestinal acidity favor the absorption of calcium.

Substances in the Diet Affecting Absorption.—An excess of fats in the diet interferes with the absorption of calcium; fatty acids combine with calcium, forming insoluble soaps which cannot be absorbed. An excessive amount of phosphorus in proportion to calcium also inhibits absorption, a condition due, in all likelihood, to the formation of the insoluble tertiary calcium phosphate from which calcium is unavailable. Oxalic acid (present in leafy vegetables) combines with calcium, forming insoluble calcium oxalate, which cannot be absorbed.

Bergeim showed that absorption of both calcium and phosphorus is markedly increased by the addition of lactose to the diet. This result he attributes to the increased acidity due to lactic acid fermentation in the intestine. Other carbohydrates do not have this effect. Large quantities of sucrose favor absorption to a small extent, but maltose and starch actually decrease the absorption of both calcium and phosphorus. Mellanby [10] states that cereals—bread, oatmeal, maize, rice—hinder the calcification of bone.

Bergeim also showed that cod liver oil aids the absorption of calcium and phosphorus, and this suggests that vitamin D does exert some effect on this phase of calcium metabolism.

Kahn and Roe [11] have shown that calcium may be adequately absorbed from its various salts if they are taken in the interdigestive periods when the intestinal reaction is least alkaline. The failure of much oral therapy is due, undoubtedly, to the administration of calcium at times (usually after meals) when intestinal alkalinity is highest, and it is absorbed insufficiently or not at all.

In the light of these factors which govern the absorption of calcium it is likely that individual differences in the degree of absorption exist. Variability in the incidence of intestinal alkalinity among normal persons is probably as frequent as the occurrence of different degrees of gastric acidity. There is convincing clinical evidence that in at least one abnormal condition, that of hypersensitiveness, calcium is poorly absorbed, apparently because of a too high intestinal alkalinity, since with the production of intra-intestinal acidity absorption becomes adequate.[12]

BLOOD CALCIUM

Klinke has shown that calcium exists in the blood in three forms: the nondiffusible, bound to protein, and the diffusible, of which there are two forms, the ionic and the complex ionic. The ionic is said to be the available calcium, but actually little is known concerning the utilization of these three forms.

The finding of a normal figure for the total blood calcium is commonly considered an indication of a normal calcium condition. This, however, is not always so, since imbalances among the three forms may occur even if the total amount is within the normal range. A total blood calcium (in the fasting state) below or above normal, on the other hand, is usually an indication of an abnormal calcium state.

The parathyroid glands and vitamin D are necessary for preserving the normal balance among these three forms, as are also the normal amount of protein and phosphorus in the blood and the proper hydrogen ion concentration. This situation is not a simple one and obviously entails a number of coordinations and interrelationships. In the light of our present knowledge, so far as the normal individual is concerned, it would seem that the adequate supply of protein, calcium, phosphorus and vitamin D will assure the proper balance. In diseases of the parathyroid glands, or in conditions in which the protein content of the blood is increased or reduced in amount, in acidosis or alkalosis, special measures directed toward the control of the disorders must be employed.

HIGH CALCIUM, HIGH VITAMIN DIET

An adequate calcium schedule is one which not only contains the necessary amount of calcium but also those factors which make for the proper utilization of calcium.

The term "high calcium, high vitamin" is used to describe a diet in which all the food essentials are included but in which calcium and vitamins are especially stressed.

It is interesting to note that the various dietary regimens used in the treatment of tuberculosis, and devised especially to supply sufficient calcium, are exceptionally inadequate, largely because the absorption of calcium is rendered insufficient by too frequent feedings and by the food combinations commonly used.

By "high calcium" is meant from 0.70 to 1.0 Gm. of calcium, which may be obtained from one quart of milk, or from one-fourth pound of cheese. If, for any reason, these foods cannot be taken, this amount may be obtained from 80 grains (5 Gm.) of calcium lactate or 160 grains (10 Gm.) of calcium gluconate a day. By "high vitamin" is meant some form of vitamin D (the equivalent of 30 drops of viosterol) in addition to from 6 to 8 ounces (180 to 240 cc.) of orange juice and from 6 to 8 ounces of tomato juice. If calcium salts are substituted for milk or cheese, the vitamin A supplied by the latter is lost, and to make up for this deficiency cod liver oil, or a cod liver oil concentrate (which contains both vitamins A and D), is employed in place of viosterol.

Orange and tomato juices are used in the diet because of their content of vitamins A, B and C, and of citric acid. Sherman says, "probably each of the vitamins A, C and D bears an important relation to the metab-

10. Mellanby, Edward: Foodstuffs and the Calcification of Bone, read at the annual meeting of the British Medical Association, July 29, 1932.
11. Kahn, B. S., and Roe, J. H.: Calcium Absorption from the Intestinal Tract in Human Subjects, J. A. M. A. **86**: 1761 (June 5) 1926.
12. Unpublished data.

olism of calcium and phosphorus in the development of bones and teeth." The mechanism of their action awaits further investigation. Vitamin B plays a rôle in the maintenance of intestinal tonicity[13] and in this effect probably has a bearing on the absorption of calcium as well as of other substances. Citric acid affects the diffusibility of calcium in the blood and plays an important part in certain diseases of the blood vascular system.[12]

It is exceedingly unusual to find an intolerance to orange or tomato juice. They are taken without difficulty even in cases of peptic ulcer. In fact, results in some of the disorders of the digestive tract—constipation, duodenal ulcer and colitis—are among the most satisfactory obtained from the use of the high calcium, high vitamin diet.

TABLE 3.—*Schedule for the High Calcium, High Vitamin Diet*

Breakfast:
Orange juice, 6 to 8 ounces
Another fruit (except bananas), cooked or raw (if desired)
Two glasses of milk (or clabber, or buttermilk)
Coffee, if desired
Luncheon:
Vegetables, cooked or raw (except potatoes)
Salad (with lemon dressing and without oil)
Fruit, cooked or raw (except bananas)
Two glasses of milk (or clabber, or buttermilk)
One or two hard-boiled eggs (if desired)
Dinner:
Tomato juice, 6 to 8 ounces
Meat or fish
Anything else desired
Ordinary portions to be taken, and no second helpings if weight reduction is desired
Eight teaspoonfuls of lactose a day. The lactose may be taken at any time but it is suggested that it be taken in the milk, 2 teaspoonfuls to each glass
Some form of vitamin D: 30 drops of viosterol, or its equivalent

Ordinarily, vitamin D is supplied by the action of the sun on the skin, and only small and inadequate amounts are found in food. The question of the desirability of having vitamin D every day throughout the whole year is still unsettled. Until further knowledge concerning the storage and utilization of this substance in the body is acquired, a plan is suggested, based on the fact that nature provides both sunny and rainy days. Ordinarily, during the summer months, if exposure to the sun is possible and a good coat of tan can be obtained, no other means of administering vitamin D is prescribed. Individuals who do not tan apparently do not manufacture their own vitamin D very adequately. Fair-skinned persons who do not tan may therefore take vitamin D by mouth four days a week the year round, thus getting four sunny and three rainy days a week. What relationship there is between pigmentation of the skin and activation of the sterol of the skin by the actinic rays to produce vitamin D is undetermined. In respect to this relationship it is an interesting phenomenon that three individuals, after taking viosterol for several months, tanned in the sun for the first time in their lives.

Bread and other starches, butter and oil are omitted from the two high calcium meals (breakfast and luncheon) because, without starch and additional fat, conditions are more favorable for the absorption of calcium.

Calcium and vitamins may, of course, be acquired by other dietary arrangements, but this schedule is designed to promote the maximum absorption of calcium from the diet. In America it is the common practice to strive for as much variety in foods as possible, on the ground that people tire of eating the same foods every day and so lose their appetites. This attitude is, evidently, largely artificial, and it is of considerable interest to see an initial opposition to the sameness of the two meals (breakfast and luncheon) give way not only to willing acceptance but to complete enjoyment of the regimen. It is extremely rare to hear complaints of monotony.

The long-lived Bulgarians of Metchnikoff fame were thought to owe their longevity to Bacillus acidophilus, which, in prevailing over the putrefactive organisms in the intestine, saved the individual from absorbing toxins. May not this longevity be due rather to their diet, largely composed of sour milk and sour cabbage, thus providing sufficient calcium and the optimum acid medium for calcium absorption?

Cantarow,[14] in a recent report on calcium therapy, considers the pharmacologic effects and the use of calcium salts, vitamin D and parathyroid extract in tetany, disturbances of ossification, pregnancy and lactation, eclampsia, acute hepatic insufficiency, jaundice, hemorrhage, edema, atopy, lead poisoning, tuberculosis, ulcerative and mucous colitis, and a number of other conditions. The fundamental importance of calcium to cell life accounts for its wide usefulness. Calcium medication is undoubtedly of value in a number of diseases. Its effectiveness has been greatly increased through the investigations of Kahn and Roe (who showed how calcium, by the oral route, is best absorbed), through Collip's parathyroid extract, and through the production of calcium gluconate, which makes possible the intramuscular administration of calcium.

Scant attention, however, has been given to calcium therapy by means of diet, a method that yields surprisingly satisfactory results.

SUMMARY

1. The average American dietary is poor in calcium content.

2. The calcium requirement is 0.70 Gm. of calcium (1.0 Gm. of calcium oxide) a day.

3. General health is improved and recovery from disease aided when the optimum calcium supply and utilization are assured.

4. Without milk or cheese in the diet it is difficult to obtain the needed calcium through food alone.

5. Utilization of calcium is ineffectual, even with a sufficient calcium intake, unless the factors that control the absorption of calcium are also adequate.

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13. Gross, L.: The Effects of Vitamin Deficient Diets on Rats, with Special Reference to the Motor Functions of the Intestinal Tract in Vivo and in Vitro, J. Path. & Bact. **27**: 27 (Jan.) 1924.

14. Cantarow, Abraham: Calcium Metabolism and Calcium Therapy, Philadelphia, Lea & Febiger, 1931, p. 125.

Osteitis Fibrosa Cystica.—Hyperparathyroidism or generalized osteitis fibrosa cystica is a clearcut, distinct disease entity caused by an increased secretion of the parathyroid hormone. This disease was first recognized clinically by Mandl in Vienna and by Du Bois in America. All cases thus far reported have been due to a parathyroid adenoma. The fact that it is a disease of endocrine origin implies that the entire skeleton is affected. Arthritis and Paget's disease are never generalized skeletal diseases. This fact alone argues against their being of parathyroid origin. Hyperparathyroidism is a disease characterized by definite alterations in the calcium and phosphorus metabolism as well as by certain symptoms and signs.—Bauer, Walter: Hyperparathyroidism: A Distinct Disease Entity, *J. Bone & Joint Surg.* **15**:135 (Jan.) 1933.

DEHYDRATION IN EPILEPSY

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The pioneer work in the clinical application of restricted fluid intake to the treatment of epilepsy was done by Temple Fay,[1] although Hartenberg[2] claimed earlier use of this method as far back as 1913.

This treatment was based on the finding of increased collections of cerebrospinal fluid in epileptic patients, demonstrated by surgeons,[3] by pathologists, and by roentgenologists using encephalography. Further basis for this method of treatment had been found in experimental work showing that excessive fluid predisposes animals to convulsions. Also, Gamble[4] showed that there was a tendency to retention of body fluids just before a seizure, and McQuarrie[5] demonstrated a parallelism between hydration and increased seizures.

Fay's[6] detailed observation on the therapeutic effect of dehydration in twenty-three cases of epilepsy appeared in 1931. His results showed a definite improvement in about 60 per cent of the cases.

Further favorable results from a combination of dehydration with a ketogenic diet were reported by Palmer[7] in one case and by Abbott and Fresk[8] in twelve cases. Likewise, there has been a surgical application of Fay's "mechanical theory of epilepsy" by Swift,[9] who has developed an operative procedure to relieve venous obstruction by "mobilization of the transverse sinus."

This conception of the nature of epilepsy has been questioned by Pagniez[10] and challenged by Cobb.[11] Cobb agrees with the observation of abnormal accumulations of cerebrospinal fluid in the arachnoid space but asserts that the pressure must be higher in the ventricles than in the arachnoid space about the cisterna magna, and lowest of all in the region of absorption over the ventricles. Fremont-Smith,[12] by accurate pressure measurements, demonstrated little difference during periods of dehydration as compared to periods of forced hydration.

On the clinical side, Cameron[13] found dehydration of little value in the treatment of twelve institutional epileptic patients. Doolittle[14] reported only eight of twenty-four epileptic patients improved on a regimen combining ketogenic diet and water restriction.

In view of the conflicting opinions on this subject, we shall report our clinical experience with the dehydration treatment of twenty-one epileptic patients. We realize that a report on therapy in epilepsy must take into account the type of patient, the duration of the illness and especially the factor of time. In consequence, the evidence gained from a brief study of so few cases over a short space of time in a disease so intangible as epilepsy can carry little weight.

NATURE OF STUDY

Our twenty-one subjects were taken from a larger group of some 100 epileptic patients who attended an outpatient epileptic clinic. There were two criteria used in the selection of patients: 1. The attacks should be of a type and frequency that could be tabulated. 2. The patients should be able to cooperate.

The majority of our patients belonged to the idiopathic epileptic group; four had organic brain lesions; one case was diagnosed hystero-epilepsy. Most of our patients had been under our own observation for a period of from one to ten years, the course of the disease being well known in each instance. A routine Binet mental test, rechecked at intervals, showed an average intelligence quotient of 75.

PROCEDURE

Nine patients were hospitalized, each for a period of about a month. The daily free fluid intake was started at 1,000 cc., and reduced by 100 cc. each day or on alternate days, until the patient was allowed to have but 400 to 500 cc. This level was maintained for from one to two weeks; then the patient was allowed all the fluids he could take—from 4 to 7 liters in twenty-four hours. A comparison was made between the frequency of attacks during the periods of dehydration and of hydration.

Twelve ambulatory patients, excluding those who had been hospitalized, were placed on a similar dehydration program. They were advised, after a gradual reduction, to limit their free fluids to 500 cc. daily. In addition, most of them were put on a diet with a predominant acid ash. The subjects who had been taking phenobarbital were allowed to continue with such medication, lest the discontinuance of sedative therapy precipitate status epilepticus. (One of the first "dehydration" patients, not included in this study, died in status.)

This regimen was maintained from three to twenty-two months. The cooperation was checked frequently by the simple expedient of measuring the specific gravity of the urine. A low specific gravity was a clear indication that the diet was not strictly followed.

Unfortunately, perfect cooperation was not secured in all instances. The adherence of the average epileptic patient to a strict regimen is subject to lapses. Even in hospitalized cases, it is sometimes difficult to combat thirst.

RESULTS OF TREATMENT

The results of the dehydration treatment are summarized in the accompanying tables: Table 1 gives the details of the hospitalized patients. Table 2 is a condensed outline of the data from the ambulatory patients.

The nine hospitalized patients presented cases of chronic epilepsy; most of them had been having frequent seizures over a period of years. The course of their illness had been little influenced by earlier therapy. A brief trial of dehydration made little change in their status. It is noteworthy that a change in the regimen from dehydration to hydration induced seizures in one

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8. Abbott, W. D., and Fresk, Evelyn: Dehydration in Epilepsy, J. Iowa M. Soc. **21**: 241 (May) 1931.
9. Swift, G. W.: Epilepsy: Relation of Water Metabolism and Cranial Sinuses, Surg., Gynec. & Obst. **54**: 556 (March) 1932.
10. Pagniez, P. H.: Le rôle de l'hydration dans l'épilepsie, Presse méd. **38**: 1574 (Nov. 19) 1930.
11. Cobb, Stanley: Causes of Epilepsy, Arch. Neurol. & Psychiat. **27**: 1245 (May) 1932.
12. Fremont-Smith, Frank: The Influence of Fluid Intake on the Intracranial Pressure in Man, Arch. Neurol. & Psychiat. **28**: 237 (July) 1932.
13. Cameron, D. E.: Dehydration Method in Epilepsy, Am. J. Psychiat. **11**: 123 (July) 1931.
14. Doolittle, G. J.: Dehydration and Ketogenic Diet in Epilepsy, Psychiatric Quart. **5**: 135 (Jan.) 1931.

subject but did not precipitate attacks in the others. Also, the withdrawal of phenobarbital from those on a dehydration program induced attacks regularly.

There was no striking change in the general health of the patients during dehydration. All complained of thirst—a few, quite bitterly. The others became readily accustomed to the low intake. As has been noted by other observers, the specific gravity of the urine rose. Acetone appeared occasionally.

years. Earlier therapy had not benefited them substantially.

During the period of dehydration, there was no marked alteration in the general health or in the frequency of the seizures. E. G., a girl, aged 15 years, whose epilepsy developed after an attack of encephalitis, responded well to the treatment with phenobarbital and dehydration. The attacks stopped for eighteen months. When the dehydration was discontinued, there were no

TABLE 1.—*Hospitalized Patients*

Number	Patient	Age, Years	Duration of Disease	Type	Previous Status	Status During Dehydration	Effect of Hydration	Comment
1	M. S.	35	24 yrs.	Idiopathic	Phenobarbital and sodium borate; 1 grand mal attack per month	500 cc. for 2 weeks; no attack; "uncomfortable from thirst"	7 liters in 24 hours; 2 attacks	Further dehydration; ambulatory; no change
2	M. C.	17	16 yrs.	Idiopathic	Frequent attacks, little influenced by therapy	500-200 cc.; one grand mal attack in 2 weeks	5 liters in 24 hours; no attacks induced	Dehydration; ambulatory; slightly better
3	S. B.	23	12 yrs.	Idiopathic	Frequent attacks, little influenced by therapy	1,000 cc. for 10 days; 500 cc. for 10 days; phenobarbital stopped grand mal attacks	5 liters plus phenobarbital; no attacks	Dehydration; ambulatory; no benefit
4	I. Z.	18	11 yrs.	Idiopathic	1 grand mal attack per week	600 cc. for 4 weeks; grand mal per week	4-5 liters; no change	Went to epilepsy colony
5	T. Z.	18	7 yrs.	Idiopathic	Grand mal per week on phenobarbital	2 weeks 600 cc.; same	Moderate hydration; no change	Dehydration; ambulatory; no change
6	S. K.	13	1 yr.	Idiopathic?	Occasional petit mal attacks	400 cc. for 4 weeks; unchanged	No hydration	No follow up
7	A. C.	45	33 yrs.	Idiopathic	Frequent (grand mal per week) attacks on phenobarbital	600 cc. for 2 weeks; no change	No change	Short psychotic episode
8	S. B.	32	23 yrs.	Idiopathic	1 grand mal attack per week	400 cc. for 2 weeks; no change; spinal fluid pressure	Unchanged; same during hydration and dehydration	Dehydration not followed
9	B. B.	20	17 yrs.	Organic	Frequent grand mal attacks	600 cc. for 2-3 weeks; no change; phenobarbital stopped grand mal attack	Hydration of 6 liters plus ampoules of pitressin; no attacks	Dehydration not continued

TABLE 2.—*Ambulatory Patients*

Number	Patient	Age, Years	Duration of Disease	Type of Epilepsy	Previous Status	Period of Dehydration	Average Seizures		Comment
							Before	After	
1	V. V.	13	7 years	Idiopathic	Attacks unchanged by sedatives, ketogenic diet, etc.	10 months	1-5	1-4	No change
2	A. T.	19	18 years	Idiopathic	Phenobarbital; no effect	8 months	2-3	2-3	Course unchanged
3	P. M.	49	3 years seizures also from 1892-1902	Organic (?); arteriosclerosis	Phenobarbital; pellagra diet; no change	7 months	5	6	Attacks continued
4	E. G.	16	15 years	Organic (?); encephalitis in infancy	No previous study	18 months	2-3	0	Attack free during dehydration plus phenobarbital
5	A. B.	22	9 years	Organic (?); encephalitis at 2 years	Improved by phenobarbital	14 months	1	2-3	No improvement
6	S. D.	41	4 years	Idiopathic	Slight improvement by phenobarbital	8 months	1-4	1-3	No change
7	W. M.	28	19 years	Idiopathic	Slight improvement by phenobarbital	14 months	1	1	No change
8	P. C.	41	7 years	Idiopathic	Improved by phenobarbital	8 months	0-1	0-1	No change
9	F. G.	40	9 years	Organic (?); chronic alcoholism	Little response to therapy	22 months	5-8	3-7	No remarkable change
10	L. W.	41	15 years	Idiopathic	Some improvement under sedatives	9 months	1-4	0-3	Practically no change
11	E. C.	30	20 years	Idiopathic	Slight improvement with sedatives	3 months	1-2	1-2	No change
12	S. G.	32	20 years	Idiopathic	Sedative, ketogenic diet; little improvement	24 months	1-2	1-2	No change

Four of the nine patients continued on a regimen of dehydration following the hospital stay. M. S. showed no change in the number or severity of attacks for a period of six months; B. B. likewise was not benefited by the low fluid intake. M. C. was decidedly relieved for three months, only to suffer a return to her usual periodicity of seizures. T. Z. was improved during dehydration, but there was further reduction in attacks when unlimited fluids were allowed.

The twelve patients included in the ambulatory group were likewise chronic epileptic subjects whose seizures were frequent and had been present for a period of

attacks, but when the phenobarbital was discontinued, the attacks returned. The benefit that this patient enjoyed was therefore to be attributed more to the sedative therapy than to the dehydration.

COMMENT

In general, we felt that the influence of dehydration was not significant. There were no clear-cut instances of marked improvement. The hospitalized patients had almost as many seizures during strict fluid limitation as during a copious fluid intake. Patients who had been free of attacks on phenobarbital and dehydration

developed spells when phenobarbital was omitted but did not develop seizures when fluid was allowed.

Our negative results, consistent with Cobb's interpretation, are out of harmony with the favorable reports of Fay and others. For this difference there are several possible explanations. Our patients had chronic epilepsy and their illness could be little altered by any therapy. The same explanation might be offered for the negative results reported by Cameron for institutional cases. Secondly, our patients may not have cooperated perfectly. It is doubtful, however, whether patients can follow a strict regimen of dehydration when all other medical teaching is to "drink all the water you can." Lastly, the preliminary encephalography performed by Fay for his patients induced a reaction which reaches far beyond the mechanical influence of fluid withdrawal. Grant [15] reports an increased cell count after encephalography. Two of our patients not listed in this series because dehydration was not instituted remained free of attacks for long periods after encephalography alone.

SUMMARY

Our results were essentially negative; a program of dehydration had little influence on the course of the epilepsy. The change to hydration did not, with any regularity, precipitate attacks. The results of other changes in treatment, such as withdrawal of phenobarbital, emphasized the relatively minor rôle played by fluid intake.

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TREATMENT OF LOCALIZED STAPHYLOCOCCIC INFECTIONS WITH STAPHYLOCOCCUS TOXOID

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In 1928 an immunologic disaster occurred at Bundaberg, Queensland, which resulted in the death, within twenty-four hours, of twelve children out of twenty-one injected with diphtheria toxin-antitoxin mixture, subsequently proved to be contaminated with Staphylococcus. Since the publication of the report of the royal commission [1] appointed to inquire into these fatalities, there has been a noteworthy revival of interest in the toxigenic properties of the staphylococcus. It would be out of place here either to offer an historical survey of published work on staphylococcus filtrates or even to discuss in detail the various properties that have been attributed to them. But mention should be made of the work of Burnet,[2] which has received confirmation and amplification from many quarters, establishing the fact that under appropriate environmental conditions certain strains of staphylococci will produce a true exotoxin.

STAPHYLOCOCCUS EXOTOXIN

The effects of this toxin on the cells and tissues of the rabbit are specific and highly destructive. Erythrocytes, for instance, are hemolyzed and leukocytes disintegrated, while necrosis of epidermal, subcutaneous or muscular tissues results from injection into them of relatively small amounts of staphylococcus toxin. Further, if a sufficient quantity of staphylococcus toxin is injected directly into its blood stream, a normal rabbit will die with characteristic signs and remarkable rapidity. These effects are reproducible on the cells and tissues of other laboratory animals. For instance, the erythrocytes of the sheep, cow, monkey, rat, guinea-pig, cat, horse and man are to varying degrees susceptible to lysis by staphylococcus toxin, although rabbit erythrocytes are much more susceptible than those of the other animals tested; and for some reason, so far unexplained, the rabbit alone among these animals has erythrocytes against which the hemolytic power of a staphylococcus filtrate serves as a quantitative measure of its true toxin content. Again, the skin of the guinea-pig, though less sensitive than that of the rabbit, can also be used for the quantitative assay of staphylococcus toxin through its dermonecrotic power; and Parish and Clark [3] have recently published their reasons for preferring the guinea-pig for this purpose. I have noted also that subcutaneous injection of the toxin will lead to local necrosis, not only in the rabbit but also in the guinea-pig, mouse and horse.

The rapid death of rabbits given an intravenous injection of a staphylococcus filtrate was reported twenty-five years ago by Kraus and Pribram,[4] and their observation has been confirmed by various subsequent writers. Within the past year or so Gross,[5] Parish and Clark,[3] and I [6] have independently noted that guinea-pigs and mice were susceptible to the rapid lethal effect of staphylococcus toxin. Further, I have found that the cat and the rat will also die within a few minutes, and have already reported the death of a horse within two hours, after intravenous injection of staphylococcus toxin. The pathologic changes found in the tissues of animals killed in this way are very characteristic and will shortly be described in a separate publication.

A fairly close acquaintanceship with these properties of staphylococcus toxin and a study of the toxigenic capacity of strains isolated from human patients led me to suppose that many of the pathologic changes in localized staphylococcic infection might be attributable to the exotoxin. If this supposition was correct, and a suitable antigen was available, it appeared possible that active immunization of human patients against staphylotoxin might result in a favorable modification, and perhaps cure, of their present staphylococcic infections, with some degree of protection against similar infections in the future.

STAPHYLOCOCCUS TOXOID

The fact that staphylococcus toxin could be detoxicated by the addition of solution of formaldehyde and yet remain antigenic (a procedure to which Ramon's work on diphtheria toxin had drawn renewed attention a few years previously) was apparently first recorded by Burnet [2] in 1929. More recently, Burnet [7] has discussed in three papers the optimum conditions for preparing the toxoid, and also its flocculating properties and binding power against animal antitoxic serums. Panton, Valentine and Dix,[8] and I [6] have also

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noted the possibility of detoxicating staphylococcus toxin with solution of formaldehyde. Before attempting to immunize human beings therewith, I used toxins treated with formaldehyde ("toxoids"), obtained from highly toxigenic staphylococcus strains, as antigens for rapidly inducing a marked degree of active immunity in the rabbit and horse, against the hemolytic, dermonecrotic and lethal properties of the toxin. The serum of animals immunized in this manner neutralized and gave passive protection against the same properties of toxin prepared from any strain.

A group of six normal male laboratory workers then volunteered to receive increasing doses of staphylococcus toxoid at weekly intervals by subcutaneous injection. An increase in the serum content of staphylococcus antitoxin was in each case measurable at the end of the course of injections. The actual increment varied within wide limits in the different cases. The reactions also varied with the different individuals, from the slightest local tenderness to a painful, red, swollen arm, with mild general malaise on the day following the injection. In no instance was the reaction of such magnitude as to preclude the advisability of giving small subcutaneous injections of the toxoid to human patients suffering from localized staphylococcic infections.

The samples of toxoid used in this work were prepared by adding 0.3 per cent solution of formaldehyde (U. S. P.) to the pooled toxins obtained from several highly toxigenic strains, recently isolated from staphylococcic lesions of various types in human patients. The toxins were obtained by means of a modification of Burnet's method, which I [6] have fully described elsewhere. After the toxin treated with formaldehyde had been incubated at 37 C. for forty-eight hours, samples were taken out and tested at intervals for residual toxicity. The toxoid had to pass very stringent tests before being released for use on human patients. For example, a representative pooled toxin is one of which originally 0.0003 cc. sufficed completely to hemolyze 1 cc. of a 1 per cent suspension of rabbit erythrocytes in physiologic solution of sodium chloride after one hour's incubation in the water bath at 37 C.; of which 0.00014 cc. when injected intradermally into the back of a closely clipped rabbit would induce an area of necrosis having a diameter not less than 0.5 cm.; and of which 0.1 cc. injected intravenously in a rabbit weighing 1 Kg. would cause death of the animal within one hour. Such a toxin would not be considered sufficiently detoxicated until 0.1 cc. would induce neither hemolysis nor skin necrosis with the aforementioned standard conditions, or until 3 cc. could be injected intravenously into a normal rabbit's veins without causing any apparent symptoms. When these criteria were satisfied, the toxoid would be Seitz-filtered, tested for sterility and submitted to the following final tests: Five cc. was injected subcutaneously into a normal guinea-pig, 0.5 cc. intraperitoneally into a normal mouse, and 0.1 cc. subcutaneously into a normal human being, in order to detect the presence respectively of excess of nonspecific toxic substances, of antiseptic, or of whatever might make the toxoid unsuitable for injection into human beings. The antigenicity of the final product was verified by provoking therewith an active immunity in the normal rabbit against staphylococcus toxin.

PLAN OF TREATMENT

Preliminary animal tests indicated that, if the toxoid was to be injected subcutaneously, a slowly increasing dosage at intervals of from five to seven days was likely to provoke the best response in human subjects. The plan of treatment finally adopted, and in essentials always adhered to, was as follows: The initial dose of 0.05 cc. was given subcutaneously into the arm above the deltoid muscle insertion. Successive doses of 0.1, 0.15 and 0.2 cc. were given by the same route every five to seven days. Before the first injection of the toxoid, and again a few days after the fourth injection, 2 cc. of venous blood was taken from the patient and allowed to clot. The serum was pipetted off, inactivated by heating at 56 C. for thirty minutes, and its content in staphylococcus antitoxin then estimated by titration of its antihemolytic power against a staphylotoxin of known hemolytic unitage, with the use, as an indicator, of a 1 per cent suspension of "packed" rabbit erythrocytes in physiologic solution of sodium chloride.[9]

By this method, after the four doses of antigen had been given, an increased amount of circulating staphylococcus antitoxin was in every instance demonstrable, which was, in general, commensurate with the degree of clinical improvement that had meanwhile occurred. The first series of injections was usually supplemented by a further series of four or more larger doses, the antitoxin content of the serum being again assayed as occasion seemed to demand, and in every instance a few days after the complete course of injections had been given. Patients were required to report, as far as possible, at monthly intervals thereafter, in order that their continued freedom from recurrence of infection might be ascertained and a blood specimen taken for estimation of circulating antitoxin.

Treatment with the toxoid was undertaken only when the clinical signs of a primarily staphylococcic infection were confirmed by the isolation from the infected site of a toxigenic staphylococcus in pure or almost pure culture. The hemolytic power of toxins derived from such strains, against a 1 per cent suspension of rabbit erythrocytes in physiologic solution of sodium chloride, varied between the wide limits of 5 and 10,000 hemolytic units per cubic centimeter, the majority of strains yielding toxins of between 200 and 1,000 hemolytic units per cubic centimeter. Since no obvious correlation was noted between the type or severity of the clinical infection and the capacity of the causal organism to produce toxin in vitro under the standard conditions of the method used, and since the toxins produced by different staphylococcus strains appear to possess qualitatively the same antigenic potentialities, no advantage was considered likely to derive from preparing a separate autogenous toxoid for the immunization of each patient. A toxoid was therefore made from the pooled, highly potent toxins derived from ten selected strains.

The limited space available precludes any attempt to give the clinical history and serologic data in each of twenty-eight patients suffering from intractable staphylococcic infection who have been successfully treated with a series of injections of this toxoid. A brief summary of the results obtained is therefore given, an outline of one particularly interesting case being offered as an epitome of the others.

Sixteen patients, aged from 11 to 60 years, had severe boils. In some instances, boils had recurred in crops for several years. In others, patients had never been free from boils for many months. An average of 2 cc. of staphylococcus toxoid was

9. There is now abundant experimental evidence supporting this as an authentic method of staphylococcus antitoxin assay. It was chosen to titrate the antihemolytic power of the serums rather than their antidermonecrotic or flocculating power, because of the greater simplicity and speed of the first method.

given by subcutaneous injection in eight doses over a period of six weeks. Two patients received only four, and two others received as many as twenty doses. The average initial titer of circulating staphylococcus antitoxin was around 8 antihemolytic units, whereas in a group of healthy persons of equivalent age the average titer would be around 20 or 30 antihemolytic units. All patients have now been free from boils for periods ranging at the time of writing from two to eight months, and their circulating antitoxin titer, although fallen from the maximum attained, is still, on an average, tenfold higher than it was initially.

There were six cases of a severe type of pustular acne with furunculosis in adolescents, all of at least two years' duration. The same statements apply as in the first group, in regard to the average amount of toxoid injected and the titers of circulating antitoxins present before and after treatment. All cases resulted in clinical cures.

One case of generalized acute bullous impetigo in a Negro, aged 36, with an initial antitoxin titer of 80 antihemolytic units, cleared up with surprising rapidity after five injections of staphylococcus toxoid (1.5 cc. in all) had raised his titer to 160 antihemolytic units.

Single cases of recurrent eczematization of skin, of severe pustular dermatitis, and of extensive abdominal cellulitis following laparotomy (all of staphylococcic origin) healed within so short a period after institution of the toxoid injections as to leave no reasonable doubt regarding the benefit they had received from this immunizing procedure.

In two cases of recurrent staphylococcic sinusitis, one of exceptional severity and long duration, the symptoms of infection were lost after the titer of circulating antitoxin had been much increased by a series of toxoid injections.

The following, more detailed, account of recurrent boils with angioneurotic edema may perhaps be justifiably given:

A woman, aged 34, a high school gymnasium teacher, referred by Dr. E. J. Trow of Toronto and seen early in July, 1932, for about seven years had been subject to recurrent boils, which appeared chiefly in the winter months but were liable to follow overexertion in any season. She had "over 500 boils within three years of their onset, including thirty carbuncles having seven or eight outlets, and several finger-infections requiring long incisions. Then gave up counting." Large, edematous swellings of the face and limbs, causing considerable local distortion and pain, were also liable to occur at times when a boil was developing there. She was quite incapacitated from her work on such occasions, and during the winter months a week rarely passed without at least one day's absence. She had tried countless previous remedies, including vaccines, without benefit resulting.

The initial antitoxin titer of her serum was between 12 and 16 antihemolytic units. Weekly injections of toxoid were instituted, and nineteen injections (totaling 10.5 cc. of toxoid) were received. The patient gave an unusually slow response to the antigen. Thus, although her titer of antitoxin rose to 60 antihemolytic units after four doses (0.55 cc.), it was still at the same level over three months later, at which time fifteen doses (6.3 cc.) of toxoid had been given. The 60 antihemolytic units in her serum allowed her to enjoy a far greater degree of freedom from infection than heretofore, but this amount was evidently not quite sufficient to afford complete immunity. Two modified infections occurred during these three months, one a whitlow, from which, on incision, a small bead of pus was obtained, yielding a pure culture of highly toxigenic Staphylococcus aureus; and the other a small boil on her chin.

However, each of the last four doses given resulted in a considerable increment in the titer of circulating antitoxin, which jumped to 120, 140, 200 and 260 antihemolytic units successively, when estimated at weekly intervals. Since the time when the titer rose from 60 to 120 antihemolytic units (now over two months ago) the patient has been entirely free from staphylococcic infection. She has had none of the characteristic edematous swellings since the treatment began, and has this year also felt much better in general health.

The only further comment I wish to make regarding this case, and applicable to several of the others treated, is that although "sensitization" to some product of the staphylococcus would appear to have been present as well as susceptibility to infection by the coccus, the patient suffered no general or focal reactions of any sort throughout a long series of toxoid injections. My experience has been that although patients not uncommonly have, in fact, local pain, swelling and redness of the arm on the day following the injection, particularly after the first dose or two, the discomfort is never of serious magnitude and is usually negligible. Further, I have now given more than 500 subcutaneous injections of staphylococcus toxoid to human patients of all ages from 10 to 67, with not more than ten complaints of slight subsequent malaise and headache.

The results recorded would appear to indicate the ready amenability of certain types of staphylococcic infection to the specific treatment given. About thirty other cases of various kinds are under treatment, and it has been remarkable to note the beneficial effects following two or three injections of the toxoid in the majority of these. Cases of recurrent and persistent boils, in my experience, invariably respond to toxoid injections. Sixteen patients of this type have either remained free from recurrence for periods that are of long duration, when compared with their intervals of freedom from infection prior to immunization, or proved able rapidly to overcome a crop of boils that had long resisted various kinds of previous treatment, after two or three injections of the toxoid had been given. In other words, alleviation or disappearance of intractable infections of long duration occurred always too soon after a few subcutaneous injections of the toxoid had been given, to be attributed to the effects of favorable fortuitous circumstances, a conclusion that seemed to me partly to justify publication of this preliminary report.

Six patients with pustular acne and furunculosis quickly ceased to have further furuncles, and the pustular factor in their acne soon afterward became negligible. Among the remaining cases treated were a variety of less common types of staphylococcic infection, but the results obtained by immunization with the toxoid were always very favorable. While the number of cases of all types could have been multiplied manifold, treatment was, as a rule, confined to those I could myself conveniently control and observe, in order to insure prompt and accurate administration of the injections and faithful withdrawal of blood whenever required for antitoxin assay.

COMMENT

At the time of writing, rather less than a year has passed since the earliest of this series of patients began to receive injections of staphylococcus toxoid. Sufficient time has obviously not yet elapsed for any confident statement to be made regarding either the duration of the immunity they appear to have gained, or the nature of the future changes that may occur in their serum content of staphylococcus antitoxin. It is arguable that immunization with staphylococcus toxoid against localized staphylococcic infections is a procedure analogous to antidiphtheria prophylaxis by diphtheria toxoid injections. But one cannot presume that the analogy should be pressed so far as to cover the duration of the immunity conferred by these two measures. However, even if the immunization procedure described in this paper were efficacious only for the cure or prevention of an attack of boils in a susceptible person, staphylococcus toxoid would still be of therapeutic and prophylactic value. The deleterious effects of an attack of boils may be far more wide reaching than is generally imagined, and those who have suffered from such an

attack will acknowledge the serious degree of disability and disturbance of general health that may be occasioned. Boils should be regarded as potential sources of devastating, and maybe fatal, generalized infections, rather than as mere manifestations of parasitism on the part of an almost ubiquitous and comparatively inoffensive micro-organism.

A number of facts relevant to the problem of immunity and susceptibility to staphylococcic infection have come to light during the course of this investigation, but they may more appropriately be discussed at a later date, when a less provisional elucidation of them may be available. However, one or two general observations may perhaps be placed on record now. For instance, it is found that patients who have long suffered from the most common and indubitable form of staphylococcic infection, namely, boils, show no more and often less circulating antitoxin than do healthy persons of the same age. In other words, repeated superficial infections of this type give no antigenic stimulus capable of evoking antitoxin production; whereas, if the patient is given three or four small subcutaneous injections of staphylococcus toxoid over a period of two or three weeks, the titer of his circulating antitoxin will rise as a rule well above the titer encountered in healthy persons of the same age. By the end of this period, a considerable degree of clinical improvement will be evident, and a further series of injections will result in apparent cure.

On the other hand, cases of recurrent staphylococcic infection involving deeper tissues, such as bone and muscle, show a greater amount of circulating antitoxin than is usually found in normal persons of similar age. Yet despite their more than average amount of circulating antitoxin, such persons remain subject to recurrences of staphylococcic infection. It is certainly possible to raise the serum antitoxin titer of such patients to a still higher figure by giving them a course of injections of staphylococcus toxoid. Among the patients now under treatment are included both children with recurrent migratory osteomyelitis and adults with a long history of repeated staphylococcic abscesses of bone and deep soft tissues. These have responded very well serologically to the antigenic stimuli that have been deliberately applied to them. For example, a man, aged 40, with recurrent staphylococcic abscesses for four years, increased his titer of circulating antitoxin from an already high value of 100 antihemolytic units to 3,000 antihemolytic units, after a total of 2 cc. of toxoid had been injected subcutaneously over eight doses at intervals of five days. The future history of such patients will be followed with interest.

I do not suggest that there is a particular titer of circulating antitoxin above which all persons could safely be considered immune to any form of staphylococcic infection, for the staphylococcus is perhaps the most adaptable of all common pathogenic micro-organisms. But though it is able to multiply in vitro in concentrated horse serum of an antitoxic titer considerably higher than the maximum I have yet succeeded in provoking in any human patient, the clinical results appear to indicate that the staphylococcus is no longer able to maintain itself in human tissues when the antitoxin circulating in the blood is raised by the method described to a titer far higher than that initially present. In patients so immunized, it is possible that the leukocidic and necrotizing exotoxin is at once neutralized on liberation from the infecting staphylococci, permitting both the leukocytes to assert their natural phagocytic function and also the tissues to undergo a reparative reversion to a gel state affording no pabulum for any surviving staphylococci.

A further analysis of the factors that probably operate for and against staphylococcic infection in human beings must be deferred to a later date.

SUMMARY

1. Staphylococcus strains isolated from infected human patients produce, under appropriate conditions, a true exotoxin having characteristic destructive effects on the cells and tissues of experimental animals.

2. Staphylotoxin can be rapidly detoxicated by the addition of 0.3 per cent solution of formaldehyde (U. S. P.), yielding a highly antigenic toxoid which may be safely injected subcutaneously into human patients.

3. A few small subcutaneous injections of staphylococcus toxoid given at intervals of from five to seven days will rapidly provoke an increased amount of circulating staphylococcus antitoxin both in experimental animals and in man.

4. The content of staphylococcus antitoxin in any serum may be easily estimated by titrating its antihemolytic power against a staphylotoxin of known hemolytic unitage, using as an indicator a 1 per cent suspension of "packed" rabbit erythrocytes in physiologic solution of sodium chloride.

5. Twenty-eight patients suffering from intractable, persistent or recurrent staphylococcic infection, including sixteen severe cases of boils, received a series of injections of a toxoid prepared from several strains selected for their high toxigenicity. Alleviation, and then apparent cure, of their infections occurred soon after the commencement of the treatment in each case and could be correlated with an increased titer of circulating antitoxin.

SIMPLE TEST FOR PREGNANCY USING IMMATURE FEMALE ALBINO RATS

PREMATURE ESTABLISHMENT OF VAGINAL ORIFICE BY INTRAPERITONEAL INJECTIONS OF URINE OF PREGNANT WOMEN

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Certain rodents, notably the guinea-pig, the rat and the mouse, do not have patent vulvas until about the time of sexual maturity. It has been known for a long time that in the guinea-pig the vaginal orifice becomes closed after each heat period and remains so during the anestrous interval and throughout pregnancy as well. In the rat, the opening, once established about the time of sexual maturity, is a permanent one.

The histogenesis of the periodic opening and closing of the vaginal orifice in the guinea-pig was investigated by Papanicolaou and me.[1] It was conclusively shown that the opening process is accomplished by increased vascularity and cornification. There is no vaginal closure membrane, but the dorsal and ventral vaginal lips are cicatrized together for an eighth of an inch or more. The process of scar formation in the

Contribution No. 9, series B, from the Department of Anatomy, University of Georgia Medical Department.

1. Kelly, G. L., and Papanicolaou, G. N.: The Mechanism of the Periodical Opening and Closing of the Vaginal Orifice in the Guinea-Pig, Am. J. Anat. **40**: 387-411 (Nov.) 1927.

closure process is accompanied by the advent of myriad plasma cells and the formation of fibroblasts.

The vaginal opening in the rodent at the first estrus (and subsequently at each heat period in the guinea-pig) is the result of the hyperplasia that is caused by the action of estrin, turned into the circulation by the ovaries.

The basis of the experiments reported in this communication is the action of the anterior pituitary

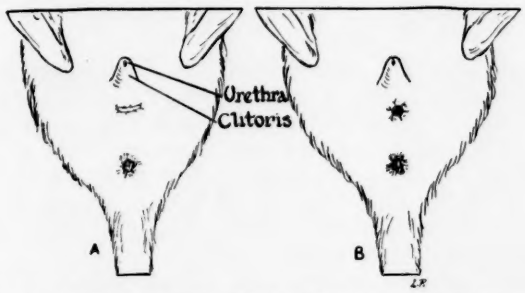

Fig. 1.—*A*, site of future vaginal orifice in immature female rat (closed vagina); *B*, vaginal orifice established.

hormone on the immature ovary, as shown by Aschheim and Zondek [2] and by Smith and Engle.[3] Since the urine of pregnant women contains a sufficient quantity of a substance that has an action similar to that of anterior pituitary transplants on the ovary, the injection of such urine should cause the stimulated ovaries to produce a precocious estrus.

Guinea-pigs, albino rats and albino mice were considered as being possibly suited for the test. The guinea-pig has a cycle more than twice as long as that of the rat or the mouse and its ovary does not respond so quickly to anterior pituitary stimulation, as is shown by Papanicolaou.[4] We found this animal unsuitable for the purpose.

White mice cannot accommodate sufficiently large injections, and the organs are too small for satisfactory observation, so they were likewise considered unsatisfactory.

Female albino rats of a certain size are excellent material for this reaction. They are easy to handle, can accommodate large injections of urine intraperitoneally without mishap, and are easy to observe (fig. 1).

The site of the vaginal orifice in the immature rat is a slightly crescentic white cicatrix just behind the clitoris (which in all the rodents mentioned herein is traversed by the urethra, as the penis is in the male). At the first opening a small amount of fluid exudes from the opening, which now assumes a round shape. Just before the opening a few strands of epithelial tissue can be seen still holding the lips together. In some cases the escaped fluid dries in such a way as to obscure the fact that the vagina has opened. On examination, if there is not a distinctly closed vaginal site or a patent opening, the animal may be grasped by the neck and shoulder region (not around the abdomen) with one hand and the base of the tail pulled stoutly with the forefinger and thumb of the other hand (fig. 2). If the vagina is open, this maneuver will round the orifice out so that the lumen can be seen.

2. Zondek, Bernhard, and Aschheim, Selmar: Hypophysenvorderlappen und Ovarium; Beziehungen der endokrinen Drüsen zur Ovarialfunktion, Arch. f. Gynäk. **130**: 1-45, 1927.

3. Smith, P. E., and Engle, E. T.: Experimental Evidence Regarding the Rôle of Anterior Pituitary in Development and Regulation of the Genital System, Am. J. Anat. **40**: 159-217 (Nov.) 1927.

4. Papanicolaou, G. N.: Specificity of Reactions Produced by Injection of Urine from Pregnant Cows into Immature Female Guinea-Pigs, Proc. Soc. Exper. Biol. & Med. **28**: 807-810 (May) 1931.

MATERIAL AND METHOD

Albino rats raised in our own laboratory were used as long as they lasted. The ages of these were known. When they were used up, rats of definite weights were ordered from a supply house. These orders were rather unusual, and the rats, when delivered, always weighed a few grams more than specified. A demand for such animals in numbers, however, would remedy this inconvenience.

A fine hypodermic needle was used in making the injections. Without removing hair from the abdomen, an area near its center was wet with a swab of tincture of iodine, and after the needle was inserted it was held in such a way as to lie parallel with the abdominal wall (against its inner surface). It is necessary to have an assistant hold the animal firmly by the fore and hind legs.

The urine is kept in refrigeration before injection but is warmed to 40 C. just before injection. The temperature of the urine by the time of injection will of course be slightly less than body temperature, the principal purpose being not to introduce ice-cold urine into the peritoneal cavity.

It seems remarkable that an animal weighing only 25 Gm. can accommodate an intraperitoneal injection of 5 cc. without harm, but it is nevertheless true.

Merely as a trial to see what would happen, two 30-day old rats were injected as follows with urine from a woman known to be pregnant: January 5, afternoon, 5 cc.; January 6, afternoon, 5 cc.; January 7, forenoon, 5 cc. The vaginas were still closed, January 7, and were not observed again until the afternoon of January 8, at which time both were completely open. Vaginal smears taken at this time were of the estrous type, one having a few proestrous cells as well. The number of hours elapsing from the first injection until the opening could not be determined because the animals were not observed the night of the 7th or the morning of the 8th. The time from the first injection until the observation of the opening was about seventy-two hours.

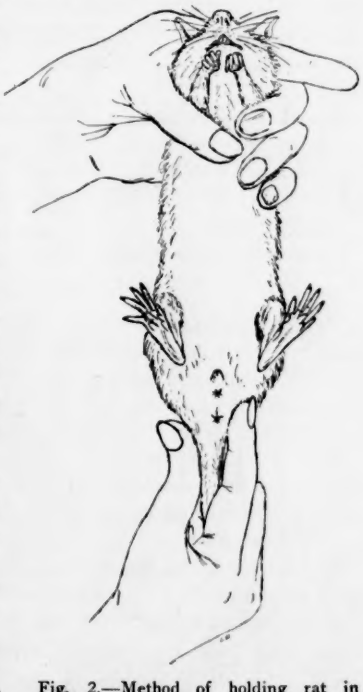

Fig. 2.—Method of holding rat in order to hollow out the vaginal lumen when opening has taken place.

January 9, between 4:30 and 5 p. m., six female albino rats, aged from 30 to 35 days, were injected with 5 cc. of urine from a woman known to be gravid. At the same time, six rats of the same age were injected with the urine of a woman known not to be pregnant. (The latter urine was obtained from women in the child-bearing age.) The injections were repeated as follows: January 10, between 9 and 9:30 a. m.; January 10, between 4:30 and 5 p. m.; January 11, between 9:30 and 10 a. m. Six of the twelve animals were considerably smaller than the other six.

Three each of the larger and of the smaller were used as test animals and three of each size as controls. On the fourth injection, urine from a different pregnant woman was injected into the test animals, the specimen used for the first injections having been used up. The three smallest test animals (weighing about 25 Gm. each) died shortly after the fourth injection, with signs of anaphylaxis. These were the only animals lost throughout the experiments. In no other cases were more than three injections given, and in many only two were given.

It is notable, as shown later, that in two test animals a single injection of 5 cc. produced openings in less time than plural injections in other animals. Whether a single injection of 5 cc. is as efficacious as plural injections remains to be determined. In view of the failure of very large injections of urine into rabbits to hasten ovulation in the Friedman test, the presumption is that a single injection of 5 cc. would be sufficient.

TABLE 1.—*Record of Immature Female Albino Rats Injected Intraperitoneally with Urine from Pregnant Women*

Animal	Age or Weight	Injections		Opening in Hours
		Number	Amount	
1T	30 days	3	5 cc.	<72
2T	30 days	3	5 cc.	<72
3T	30-35 days	4	5 cc.	<64
4T	30-35 days	4	5 cc.	<64
5T	30-35 days	4	5 cc.	<64
6T	16 days	2	3 cc.	<96
7T*	30 days 25 Gm.			
8T*	25 Gm.			
9T*	25 Gm.			
10T	30-35 days	1	5 cc.	<46
11T	30-35 days	1	5 cc.	<64
12T	35.5 Gm.	3	5 cc.	71-83
13T	48 Gm.	3	5 cc.	71-83
14T	39.5 Gm.	3	5 cc.	71-83
15T	36.5 Gm.	3	5 cc.	71-83
16T	44.5 Gm.	3	5 cc.	71-83
17T	32.5 Gm.	3	5 cc.	71-83
18T	34 Gm.	3	5 cc.	71-83
19T	33 Gm.	3	5 cc.	71-83
20T	35.5 Gm.	3	5 cc.	71-83
21T	37.5 Gm.	3	5 cc.	71-83
22T	33 Gm.	3	5 cc.	71-83

* Died after fourth injection of 5 cc.; the uterus showed definite estrous distention.

In the three animals that died, postmortem examinations revealed typical heat distentions of the uteri. The ovaries were enlarged and contained many follicles. Vaginal smears showed principally proestrous and estrous cells, with a few leukocytes in one specimen.

January 12 in the forenoon, the vaginas of the three living test animals were all open and those of the six control animals all remained definitely closed.

It had been considered possible that the vaginal smear would be of more value than the establishment of the vaginal orifice, but this was not found to be so. There may be sufficient estrin in the quantity of nonpregnant urine injected to initiate changes in the vaginal epithelium directly, but it is probable that the proestrous smears in the control animals is an expression of cyclic ovarian action that is too weak to produce a frank estrus. There is not sufficient estrin in the quantity of urine injected into controls to bring about a frank precocious estrus with cornification and establishment of the vaginal orifice.

Papanicolaou and Blau [5] demonstrated that the bitch is really polyestrous and has a rhythm of 15.62 days, which is more strongly expressed every other time. This cycle is one fourth of the gestation period of sixty-three days. They were able to intensify the weak expressions into definite estrus by means of injections of estrin and to bring bitches back into heat shortly after a regular estrous period.

Smears from the test animals will at some time around the opening give purely estrous cells as seen in the copulatory stage. On forcibly opening the vaginas of the control animals a majority of proestrous smears were obtained, none showing a majority of estrous cells.

In order to test the effect of one 5 cc. injection of urine from a pregnant source, two rats, aged from 30 to 35 days, were given this amount at 5 p. m., January 10. The vagina of one was open at 3:30 p. m., January 12, forty-six hours after treatment. The vagina of the other was found open, January 13, at 9 a. m., having probably opened during the night. The gross elapsed time was sixty-four hours.

Three females from a litter of six 16-day old rats were available from our own colony. The vagina of one of these was forcibly opened and a smear was made. A few non-nucleated (estrous) and some nucleated (proestrous) cells were found, but no leukocytes. This corroborated the uselessness of depending on smears, for this animal was so small it had not long been covered with hair. Other older female albino rats were found to have proestrous smears after no injections whatever.

Of the remaining two small 16-day old females, one was given 3 cc. of urine from a pregnant woman intraperitoneally on two consecutive days and the vagina opened within ninety-six hours, though the exact time was not determined. The vagina of the litter mate control, which received the same amount of urine from a nonpregnant woman, failed to open.

Two groups of eleven rats each were next injected with urine from pregnant and nonpregnant sources, respectively, each animal receiving 5 cc. as follows: January 18, between 10 and 10:30 a. m., and between 8:30 and 9 p. m.; January 19, between 9:30 and 10 a. m. The vaginas of all the test animals were found open in from seventy-one to eighty-three hours. None of the vaginas of the control animals opened.

These animals had been ordered from a dealer to be delivered weighing from 20 to 30 Gm. At the completion of the tests, the actual weights varied from 29 to 48 Gm., the average weight being 35.7 Gm. The weights on arrival were probably 2 or 3 Gm. less.

In their monograph on the estrous cycle of the albino rat, Long and Evans [6] state that the average age of this animal at the establishment of the vaginal orifice is 76.5 days. In a group of 200 rats, the low and high limits were 34 and 109 days. The average weight of the animal at the time of the vaginal opening is not given. This may be of equal importance.

We found that to a large extent the number of rats in a litter determined the weight at a certain age. For example, rats in two litters of ten and nine weighed about 25 Gm. each at 30 days, while rats in two litters of two and one weighed about 45 Gm. at the same age.

It was also observed that the older and larger the rat, the shorter was the time required for the opening of the vagina. In order to take advantage of the use

5. Papanicolaou, G. N., and Blau, N. F.: Existence of Sexual Rhythm and Experimental Induction of Heat in the Dog During Anestrus, Anat. Rec. **35**: 47 (March 25) 1927.

6. Long, J. A., and Evans, H. M.: The Estrous Cycle in the Rat and Its Associated Phenomena, Memoirs of the University of California number 6, 1922.

of rats as large as possible (without danger of natural establishment of the vaginal orifice), two groups of animals were ordered as follows: one dozen between 30 and 40 Gm., and one dozen between 40 and 50 Gm. The actual weights on arrival were between 38 and 49.5 Gm. for the first group and between 50 and 57.5 Gm. for the second.

Of the first group, two animals had maturely opened vaginas. One weighed 42.5 Gm. and the other 49.5 Gm. Of the second group four had open vaginas and weighed respectively 51, 53, 54.5 and 56 Gm. All of these animals were discarded.

TABLE 2.—*Record of Older Immature Female Albino Rats Given Two Intraperitoneal Injections of 7.5 Cc. of Urine from Pregnant Women*

Animal	Weight, Gm.	Opening in Hours	Animal	Weight, Gm.	Opening in Hours
23T	62	<21	32T	57	<68
24T	64	<32	33T	51.5	<68
25T	63.5	<32	34T	65	<68
26T	60	<32	35T	50	<72
27T	60.5	<32	36T	61	<72
28T	52	<45	37T	46.5	<72
29T	53.5	<45	38T	45	<75
30T	58.8	<55½	39T	59	<75
31T	53.5	<55½	40T	53	<75½

In order to determine the opening times of animals of this size, the eighteen remaining animals were injected with 7.5 cc. of pregnancy urine at 12 noon and 6 p. m., January 27. All the openings occurred in from twenty-one to seventy-five and one-half hours, as shown in table 2.

Undoubtedly, the animals with openings in less than forty-five hours were getting ready to open naturally. The remainder, no doubt, were opened prematurely by the injections. It is quite evident that if the former are disregarded, the average opening time of the latter is less than that of the younger animals, previously reported. Apparently, the more nearly mature the ovary, the quicker its response to the anterior pituitary-like element in the urine.

Since the amount of estrin excreted in the urine of pregnant women is said to be greater after the third or fourth month than before, it might be a direct aid to the anterior pituitary-like substance in establishment of the vaginal opening, though doubtless no such aid is required. In view of the fact that the opening is brought about by the increased production of estrin in the stimulated ovary, it is not worth while to remove the estrin from the specimen to be tested. If an ovarian cyst were suspected, this would possibly be necessary, since the amount of estrin in the urine might be thus greatly increased.

It is obvious that animals weighing not more than 40 Gm. should be used for the test and animals weighing between 30 and 40 Gm. are suggested as most suitable. If animals of known ages could be purchased from reliable dealers, it is probable that even heavier ones could be used with safety, possibly up to 50 Gm. Of course, the animals should be closely scrutinized before injection to make sure that the vaginas are of the immature closed type. Cystic ovarian disease in young rats might account for the very early openings in Long and Evans's series, though it is more likely that such specimens were from very small litters and weighed more than the average animal of their age. Such animals naturally should be discarded.

The urine should be given in two 5 cc. injections, one in the morning and one in the afternoon of the same day. The urine should be from the specimen first passed on arising.

It is advisable that two rats be used for each test, requiring that both vaginas open within ninety-six hours as a positive test. As a rule, the opening will occur between seventy-two and eighty-four hours. This means that if the injections are made on the morning of a certain day the result of the test can be read between morning and afternoon of the third day following. This is longer than is required for the Friedman test, which on an average is about forty-eight hours, and is shorter than required for the Zondek-Aschheim test, which takes four or five days.

The results of all the injections are summarized in the tables. The vaginal orifice was established without exception in the animals that received the pregnancy urine and in no case was it established in an animal that received nonpregnancy urine.

The advantages of this method are obvious: the ease of intraperitoneal injection, the convenient size of the animals used, the economy in raising or purchasing test animals and the facility of observing the result of the test without killing or operating on them.

SUMMARY

1. Intraperitoneal injections of from 5 to 15 cc. of urine from pregnant women will cause premature establishment of the vaginal orifice in the albino rat weighing from 30 to 40 Gm., usually within from seventy-two to eighty-four hours.

2. Intraperitoneal injections of the same amount of urine from nonpregnant women will not cause such premature opening of the vagina.

TABLE 3.—*Record of Immature Female Albino Rats Injected Intraperitoneally with Urine from Nonpregnant Women in Which Vagina Remained Closed*

Animal	Age or Weight	Injections	
		Number	Amount
1C	30-35 days	4	5 cc.
2C	30-35 days	4	5 cc.
3C	30-35 days	4	5 cc.
4C	30-35 days	4	5 cc.
5C	30-35 days	4	5 cc.
6C	30-35 days	4	5 cc.
7C	16 days	2	3 cc.
8C	29 Gm.	3	5 cc.
9C	32 Gm.	3	5 cc.
10C	34 Gm.	3	5 cc.
11C	35 Gm.	3	5 cc.
12C	35.5 Gm.	3	5 cc.
13C	32 Gm.	3	5 cc.
14C	30.5 Gm.	3	5 cc.
15C	43.5 Gm.	3	5 cc.
16C	38 Gm.	3	5 cc.
17C	35 Gm.	3	5 cc.
18C	31.5 Gm.	3	5 cc.

3. Two animals should be used and the opening of the vaginas of both is read as positive; of one, as doubtful (the test should be repeated); of neither within ninety-six hours, as negative.

4. If the vagina is open and the orifice obscure, one may see it by holding the animal by the neck and shoulder region and pulling strongly on the base of the tail. In this maneuver the abdomen should not be compressed.

5. The main advantages are the simplicity of the test and the ease of reading the result.

THE SUSCEPTIBILITY OF HEMOLYTIC STAPHYLOCOCCI TO BACTERIOPHAGE

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A portion of the problems that we are investigating have, because of their nature, led to a study of several polyvalent staphylococcus bacteriophages obtained from various sources. The recent report of Straub and Applebaum [1] on commercial bacteriophage products confirms our earlier studies.[2]

During the past two years we have tested polyvalent staphylococcus bacteriophages on 121 strains of staphylococci isolated from individuals with carbuncles, furuncles, sinusitis, osteomyelitis and staphylococcus septicemia. Seven of these strains of staphylococci, all nonhemolytic, are not susceptible to any of the phages we have used against them. These strains of bacteria were isolated from long-standing cases of furunculosis (one), sinusitis (four) and osteomyelitis (two). All these organisms grow very well on plain Savita medium [2] and multiply as rapidly at 20 C. as they do at 35 C.

Seventy-one of the strains produced strong hemolysis of rabbit, guinea-pig or human blood when they were cultivated on Savita agar to which 4 per cent blood had been added. With one exception, all these cultures of hemolytic staphylococci (albus and aureus) were found to be susceptible to polyvalent staphylococcus bacteriophages on the first contact. The one resistant culture was isolated from an abscess in a patient who was being treated for diabetes. This culture developed colonies on rabbit blood agar which were very similar to those produced by a typical pneumococcus type II, both in size and in degree of hemolysis. However, when a portion of a colony or a loop of a fresh broth culture was stained in the usual manner, the microscopic picture was that of a staphylococcus.

The remaining twenty-one strains were nonhemolytic and were also suceptible to bacteriophagy, but in several instances it was necessary to make repeated contacts with bacteriophage before complete lysis was effected.

In 1926, Epstein and Fejgin [3] reported that, in a routine examination of staphylococcus cultures, all of the hemolytic strains (thirty-one) were resistant to bacteriophagy and that there was a definite relation between the amount of hemolysis produced and the resistance to lysis by bacteriophage. They employed horse blood agar. All their nonhemolytic staphlyococci (ninety-one cultures) were phage susceptible. In 1930, McKinley and Cámara [4] reported that seven strains of hemolytic staphylococci resisted the action of polyvalent staphylococcus bacteriophage supplied by Dr. Larkum. They agreed with Epstein and Fejgin that hemolytic staphylococci were resistant to bacteriophagy.

The results that we obtained with our phages were so different from those reported by the investigators mentioned previously that we procured some horse blood and tested many of our susceptible hemolytic strains of staphylococci on a medium containing 4 per cent of horse blood. All of the twenty strains that were tested were found to be hemolytic on this medium as well as on rabbit blood agar. Furthermore, the cultures from the horse blood medium were as susceptible to our phages as they had been from other mediums.

We have recently obtained a sample of polyvalent staphylococcus bacteriophage from Dr. Larkum and find that it is able to lyse all of the hemolytic cultures of staphylococci against which it was tested (twenty-four).

It is well known that most cases of acute infection with the staphylococcus are caused by the hemolytic strains. It has also been stated [5] that chances of success with phage therapy are much better in cases of acute infection than in cases of long-standing chronic infection. The susceptibility of hemolytic staphylococci to bacteriophage supports this statement. We have also isolated nine strains of hemolytic Bacillus coli and have found that these strains also are strongly attacked by coli bacteriophages.

CONCLUSIONS

1. Hemolytic staphylococci are particularly susceptible to bacteriophagy.
2. Resistant strains of staphylococci are generally of the nonhemolytic type.

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From the Division of Protobiology, Yale University School of Medicine.

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PELLEGRINI-STIEDA'S DISEASE

A REPORT OF ONE CASE SURGICALLY TREATED

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Pellegrini-Stieda's tlisease is characterized by a semilunar-like bony formation in the region of the internal condyle of the femur and is always traumatic in origin. The condition has been and is being reported in the foreign literature. This is the first case to be described in the English literature. My object is to report one surgically treated case in detail and to discuss briefly the condition in general.

Pellegrini in 1905 called attention to a traumatic ossification of the collateral tibial ligament of the knee. The same year, Köhler reported a similar case and in 1907 Stieda, unaware of the previous work, again called attention to a semilunar-shaped calcification seen about the superior border of the internal epicondyle of the femur. Pellegrini thought that the disease was traumatic. Stieda believed it was due to a fracture with a detachment of a small particle of bone at the moment of injury, with subsequent calcification taking place in the ligament. König, Köhler, Pfister and Ewald were definitely of the opinion that the calcification was a fractureless callous formation and that it was the end result of periosteal proliferation, secondary to a tear of the ligaments and tendons at that point. They support their contention with the fact that the process never appears within less than two or three weeks following the injury. Most observers feel that it can be caused

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by either direct or indirect trauma. There is still some controversy over the origin of this formation, some believing that it is of periostitic origin, others that it arises from the surrounding connective tissues. I believe that the condition is similar to myositis ossificans. More than 136 cases have been reported in Germany and Italy. It is chiefly unilateral. The clinical course varies considerably in severity, sometimes resulting in permanent disability.

Clinically, the cases run a similar course in that the patient gives a history of a fairly slight trauma and, if roentgenograms are made immediately following the trauma, there is no evidence of dislocation or fracture. However, if the symptoms fail to subside and the patient is examined at the end of about two weeks, there will be found a typical semilunar-shaped calcification. This shadow is usually crescent shaped, though it may be somewhat fusiform or elongated or triangular. The lesion may heal spontaneously. Some believe there is no need for operative intervention, as the condition has a tendency to recur.

REPORT OF CASE

History.—G. B., a white man, aged 29, seen in the outpatient clinic, Sept. 2, 1932, complained of pain and disability in the left knee of three months' duration. The onset of symptoms followed a traumatic incident during a ball game in which he participated. Another player collided with the patient and struck him tangentially on the left knee. This mechanism of injury usually causes some internal derangement of the knee. There were no immediate symptoms, and he continued his game.

That night he experienced definite pain over the medial side of the left knee. This was rather sharp and aching in character and was progressive. Weight bearing aggravated the discomfort and occasionally enforced bed rest. Weather changes had no influence on the course of the disability. Occasionally a moderate redness appeared about the region of the internal condyle, suggesting inflammation, although he does not think that he ever had definite fever or chills. There had never been any "locking," "slipping" or "giving way" of the knee joint. There had lately developed some limitation of the joint range of motion. A sense of swelling and induration had persisted for the past several months over the medial femoral condyle. He had lost 15 pounds (6.8 Kg.) since his injury but had no subjective general bodily complaints or other joint symptoms. He had had no treatment for the local disability except for several enforced periods of rest due to the local disability.

The functional, past and family histories were essentially negative.

Examination.—The patient was well developed and well nourished and apparently not acutely ill. The systemic examination showed nothing remarkable.

He walked unsupported but with a left-sided limp. The left knee was five-eighths inch greater in circumference than the right, but the left thigh also exhibited 1¼ inches atrophy and the left calf three-eighths inch. The range of motion of the left knee was from 175 degrees of extension to 80 degrees of flexion. Beyond this range, passive attempts at further motion caused some pain in the joint.

A circumscribed tumor-like swelling was noted and could be palpated over the internal condyle of the left femur, which was tender to pressure. This was rather hard and apparently was firmly attached to the deep structures in this region. The skin over this infiltration was slightly discolored but freely movable. Abduction of the leg caused some discomfort in the region of the internal lateral ligament. There were no other evidences of internal derangement of the knee.

Roentgenograms (in the anteroposterior view) showed the typical semilunar-like bony formation about the medial condyle. The bony outlines of the lower end of the femur were clearly defined and a clear space was present between the mass and the periosteum of the femur. The bony formation was not of uniform consistency but was somewhat variegated in structure. Its margins were indistinct and irregularly outlined. Its lower limit might well have involved the upper attachment of the medial lateral ligament. No definite bony trabeculation could be made out within the ossification. No other visible changes were noted (fig. 1).

Laboratory examinations revealed: urine, normal; Wassermann reaction, negative; coagulation time, four minutes; hemoglobin, 75 per cent (Tallqvist); red blood count, 3,830,000; white blood count, 10,000.

The patient received a brief period of treatment with diathermy, massage and an elastic bandage but with no local improvement. Operation was finally indicated because of the long duration of the condition and the apparently fully developed character of the bony formation.

Operation.—September 8, under ethylene gas anesthesia and with a thigh tourniquet, a slightly curved incision was made over the palpable mass in the region of the medial condyle of the left knee. The dissection was carefully continued through the tendinous structures down to the bony mass, which measured about 4 cm. in length and 1 cm. in diameter. This formation infiltrated the tendons of the adductor magnus and vastus medialis but was nevertheless clearly defined. It was intimately related to the internal lateral ligament but did not actually involve it. It was not united to the bone or periosteum of the condyle and could be dissected and shelled out, although

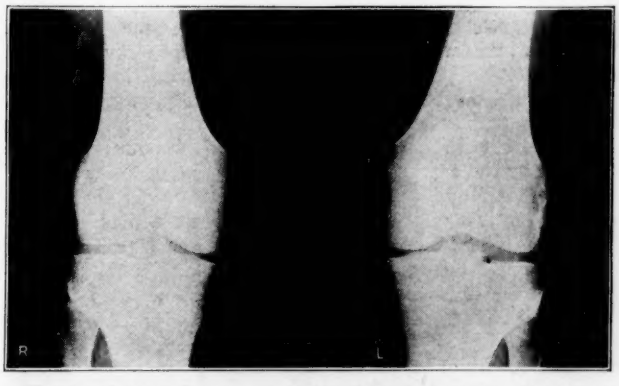

Fig. 1.—Preoperative anteroposterior view of the knees, showing the more or less typical semilunar-like bony formation in the region of the internal condyle of the left femur.

no definite capsule was present, without injury to important structures. The wound was closed in layers, with interrupted sutures; fine chromic for the deep structures, fine catgut for the subcutaneous tissues, and dermal for the skin. A dressing and long leg cast were then applied. The entire bony mass was fixed and decalcified, and serial histologic studies were made.

Postoperative Observations.—At the time of this writing, the patient has been observed about four months.

For several days after the operation, he had a slightly elevated temperature but was comfortable. The wound healed in about ten days, and the cast was removed. Physical therapy was instituted, and he was allowed gradual supported weight bearing. He was discharged from the hospital, September 17, and was instructed in home physical therapy. The postoperative roentgen examination demonstrated the complete removal of the bony formation. Unfortunately, this film has been lost, and no illustration could be made of it.

October 6, the patient was allowed to begin full weight bearing unsupported. The range of motion was then from full extension to 90 degrees of flexion. The patient was symptom free and well satisfied with the result of operation (fig. 2).

December 2, he walked without any support but with a slight symptomless limp. The region of the medial condyle is slightly enlarged and demonstrates an apparent valgus of the knee (fig. 2). There is no tenderness over this region, and the knee is stable. The range of motion is from full extension to 100 degrees of flexion. Serial roentgen examinations show

the progressive recurrence of the bony formation. It is now more extensive than the original but not nearly so dense or well defined (fig. 3).

Histologic Description of the Bony Mass Removed at Operation (by Dr. Ernest Freund).—The bony mass consisted of a rather dense irregularly distributed substantia spongiosa with the marrow spaces filled by fibrous tissue. This fibrous tissue was rich in large thin walled vessels. The marrow spaces were much larger in the central part of the mass, which was certainly the older portion, in which the spongy bone had undergone changes, resulting in its reduced density. The fibrous tissue itself was rather loose and contained a few fibers, between which were spindle-shaped and astriform cells, and in some places small groups of lymphocytes. The older central portion exhibited an even looser fibrous marrow, in which here and there appeared small groups of fat cells, showing that the fibrous bony marrow had been reconquered by the fatty marrow, a fact well illustrated in fractures in which bony trabeculae with fatty marrow eventually appear in the fibrous callus.

Because the growth of the mass occurred naturally on its free peripheral surface, this region offered an opportunity to observe different kinds of bony growth. Inspection of this border revealed three definite types of bone growth: primitive infiltrative bone growth on the basis of connective tissue, bone formation which was callus-like in character, and endochondral formation of bone.

The infiltrative type was the most common to be observed and occurred on the border between the bony mass and the tendon-like, tough connective tissue. Here the connective tissue was infiltrated in a very irregular manner by clear red homogeneous substance. In this were deposited lime salts as it approached the bony border. This was a primitive type of ossification on the basis of connective tissue (fig. 4). In the first state, osteoid tissue is formed which is transformed to real bone by the deposition of lime salts. Owing to the gradual zone of bone transformation, the actual borderline of the bony portion was not clearly depicted in these actively engaged situations. There was a gradual continuous passage, from bone into connective tissue, and even more strikingly did the connective tissue fibers merge into the bone tissue, thus forming the so-called fibers of Sharpey.

Fig. 2.—*A*, range of motion about one month after operation; *B*, appearance of knee about three months after operation.

The second type of ossification to be observed was quite callus-like in character (fig. 5). At one end of the mass was an extensive area of young hyaline cartilage with very large spherical cells and very little ground substance between them. In some spots this cartilage tissue showed a structural continuity with primitive osteoid bone tissue, which soon became calcified and underwent changes by resorption and new formation. This passage from one tissue into another must not, however, be interpreted as a direct metaplasia from cartilage to bone. Based on V. Ebner's explanation, it is known that this is not a genetic continuity but merely a local continuity in which both bone and cartilage tissues are formed at one time from a common basis of connective tissue.

The third, less important, type of bone formation was the endochondral variety of cartilage ossification. It was a rather primitive type, without the formation of a proliferation zone of

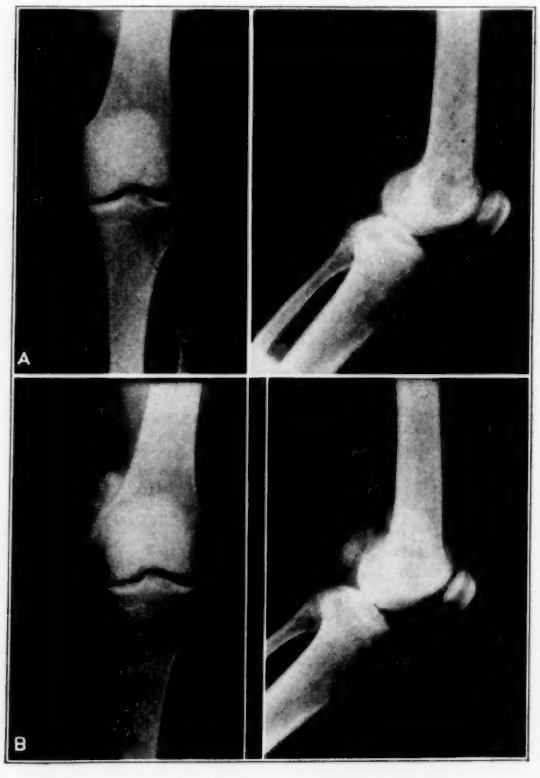

Fig. 3.—Appearance of left knee: *A*, about one month after operation; *B*, about three months after operation.

cartilage cells. Instead, there was a very primitive discontinuous zone of preparatory calcification. After the intrusion of the cartilage by small vessel sinuses, there was a resorption of the calcified cartilage. On the surface of the remaining cartilage there was then apposition of bone tissue by osteoblasts. The resulting spongy bone showed numerous inclusions of calcified cartilage tissue in the center of the trabeculae. However, in many other situations thick bony trabeculae in the central part of the bony mass showed quite frequently inclusions of primitive bone tissue of a more bluish stain, which contrasted quite markedly with the newly opposed mature lamellar bone, which stained red. The two types of bone were separated by a dark blue lacunar cement line. This picture was produced by repeated processes of resorption of primitive bone by osteoclasts and apposition of mature lamellar bone before the former process was completed.

Because of the exposed situation of this newly formed bony mass, some signs of traumatization might be expected. This was particularly demonstrated at a point at which a bony spur had been formed. Its point was fractured, and the fissure was partially filled with a network of coagulated fibrin. The contiguous thick spongy trabeculae were necrotic and were undergoing an active lacunar resorption from the intact fibrous marrow.

COMMENT AND SUMMARY

In the case of Pellegrini-Stieda's disease reported, the bony formation recurred following operation. This recurrence may have been facilitated by an inadequate period of postoperative immobilization and by

the trauma incident to the operative intervention in tissues already sensitized to the production of bone. From the literature, good results are reported both from conservative and from surgical measures. After four months the patient is symptom free and active in spite of the recurrence of the mass. It is reasonable to assume that no surgical procedure should be instituted before the bony mass has matured, just as in myositis ossificans.

There can hardly be a doubt as to the traumatic origin of the bony mass in this instance. A strain or a partial tear of the internal lateral ligament of the involved knee and its associated tendinous structures, such as the semimembranosis and the vastus medialis, might well have been the primary factor in producing the subsequent bony formation.

This bony formation is essentially very similar to myositis ossificans. It is now quite generally accepted that myositis ossificans is neither a tumor nor an inflammatory process but a so-called metaplastic hyperplasia: metatplasia in the sense of indirect transformation of one tissue into another. In this specimen, bony tissue predominates whereas there is generally found in myositis ossificans an equal amount of bone and cartilage. This is due to the fact that this case was of long duration, thus giving sufficient opportunity for a high degree of tissue differentiation. Bony predominance may also have been due to the localization of the process. In this case the bony formation—to judge from the roentgenograms and from the appearance at operation—was clearly para-osteal. It is therefore assumed that this metaplasia occurred only from the tendinous, the ligamentous and possibly even the fascial structures in this region. Such tough fibrous structures are not as conducive to cartilage formation as are the more loose connective tissues of the perimesium and the interstitial septums of musculature, which is the usual situation of myositis ossificans.

Fig. 4.—Part of the periphery of the bone mass showing the bone growth on the basis of fibrous tissue.

The definite clear space between the mass and the femoral margin clearly demonstrates that for the bone formation in Pellegrini-Stieda's disease, as in all other kinds of para-osteal bone formation—particularly myositis ossificans—there is no need for periosteal participation. None of the conceptions based on tears and dislocations of periosteal tissues into the neighboring tissues as the causes for such para-osteal bony formations are tenable. It is well known that every connective tissue is able to form bone under certain conditions. The nearer to the bone these tissues are, the more likely are they to lead to such a formation. This is demonstrated in the healing of fractures in which the para-osteal bone production in the interstitial septums and thin muscular fascias is quite considerable, particularly in old people, in whom this type of bone formation is even more important than the periosteal callous formation. This has been clearly demonstrated

Fig. 5.—Part of the periphery of the bone mass showing the bone growth on the basis of fibrous tissue, and the callus-like formation of cartilaginous and bone tissue.

by Freund, who has shown that in fracture of the neck of the femur, endosteal and para-osteal bone productions prevail over periosteal bone production.

These facts are further substantiated by the apparent para-osteal bone formation as seen in the recurrence of the growth. The periosteum was not disturbed during the operation. Immobilization of the limb may lead to the disappearance of the mass, which occurs so frequently in myositis ossificans.

The condition is important from its medicolegal aspect, as all the cases reported have been in adults who sustained their injuries while at work. Because of the tendency to heal (?), hasty judgment should be avoided. Immediate post-traumatic as well as follow-up roentgenograms are essential to establish the diagnosis and prognosis.

In considering the clinical differential diagnosis, practically all of the numerous causes of internal derangement of the knee must be ruled out. Such conditions as total or partial fractures of the medial femoral condyle (rare), and para-osteal arthropathies in paraplegic cases may produce roentgenograms similar to Pellegrini-Stieda's disease.

The treatment of this condition, as advocated in the literature, is the conservative and the operative.

The use of x-rays has been recommended, but sufficient experience is lacking to permit a true evaluation of this therapeutic measure. Diathermy and baking are said to be excellent early measures. Later, to diathermy may be added infra-red and electrical therapy. When the condition goes on to mature bony formation with persistent disability, it is apparent that surgical removal is indicated. This should be accomplished with a minimum amount of operative trauma and should be followed by a carefully observed period of immobilization and physical therapy.

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THE SURFACE TEMPERATURE AND THE MINUTE BLOOD VESSELS OF THE SKIN IN ARTHRITIS

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It is well known that there are two points of view in regard to the etiology of arthritis. One is that the bacteriologic focal infections are believed to be the usual source of the noxious bacteria; the chief exponents of this idea are American workers. The other point of view is based partly on the hereditary and constitutional makeup of the individual and partly on the nervous, gastro-intestinal, endocrine and circulatory disturbances developed during the lifetime of the patient. This theory explaining the etiology of arthritis is predominantly subscribed to in Europe.

In September, 1930, at the congress in Liége, the council of the Ligue internationale contre le rheumatism

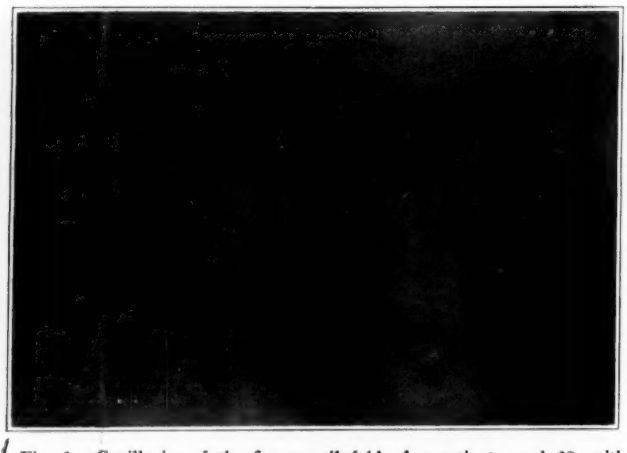

Fig. 1.—Capillaries of the finger nail fold of a patient, aged 38, with osteo-arthritis. From an unretouched photomicrograph, enlarged from a 35 mm. film with a magnification of 176 diameters.

emphasized the importance of circulatory disturbance in cases of rheumatic disease and subscribed to the theory that this is one of the essential factors in the causation and continuance of rheumatic conditions. (It was recorded as the official subject and recommended for further investigation at the congress at Liége in 1930). Until that time very little research work had been carried out in this field.

Only lately, inspired by the work of Lewis, Krogh and Ebbecke on the blood vessels of the human skin and aided by the perfection of the capillary microscope and the thermo-electrical method of measuring skin temperature, has the study of the circulation in the skin of arthritic patients attracted much attention.

Wright and Pemberton [1] state that the surface temperature was below normal in 62 per cent of arthritic subjects, measured on the base of the finger nail. They stated that the capillary field in arthritic patients usually contained less blood and was lighter in color than in normal persons. These changes, they believe, may be due to the fact that there are fewer open capillaries or that the individual capillaries are smaller. They found that the blood flow under identical conditions was slower and more frequently interrupted in arthritic subjects than in normal persons.

Rhumann [2] reports that nearly 70 per cent of the patients with muscular rheumatism have anomalies in the finger nail capillaries. He found a vasoneurotic state in several cases. This vasoneurotic state, described by Otfried Müller,[3] is characterized by the great lability and instability of the innervation of the muscular system; the capillaries show astonishing variations, for in the same capillary field both narrow loops and some enormously dilated loops may be observed; in some instances there may be dilatations—true capillary aneurysms. Rhumann found, in agreement with Pemberton, a slow and an interrupted blood flow. He considers the globules found at the vertex of capillary loops characteristic signs of poor capillary circulation and obstruction in the blood flow. Our work has led us to accept Klingmüller's [4] theory that the occurrence of globules is possible only when it is assumed that the width of the blood stream and the width of the capillaries differ, the greater width of the capillaries explaining the whirl movement of the blood.

Lunedei and Corradini [5] report that in 62 per cent of patients suffering from chronic rheumatism the background of the capillary field was lighter in color than in the normal individual. They found the number of capillaries normal, but in 70 per cent of the cases the capillaries were constricted. Vasoneurotic conditions were present in only 8 per cent. The skin was pale, and the skin temperature ranged between 24 and 28 C.

Weil,[6] in his microscopic study of the capillaries in 249 arthritic patients, reports a vasoneurotic state in 20 per cent and a poor blood flow in 25 per cent. However, he neglects to explain what he means by a poor blood flow. In his control cases, which were of the nonarticular rheumatic type, he found a vasoneurotic state in 33.3 per cent and a poor blood flow in 12.5 per cent.

Prusík,[7] studying the blood vessels of the skin in chronic arthritis, found only on the skin above the inflamed joint signs of congestion which seemed to be secondary to venous changes.

RESULTS OF STUDY

We examined eighty cases of chronic arthritis: forty of rheumatoid arthritis and forty of osteo-arthritis. The British classification rheumatoid arthritis and osteo-arthritis was used as the terminology of the two major groups. The patients were examined before treatment of any kind was given, as it is a known fact that the salicylates and other therapy change the skin circulation and affect the capillaries. The point chosen for determination of the capillaries and the surface

From the Capillary and Arthritis clinics of the Department of Medicine of the New York Post-Graduate Medical School and Hospital.

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2. Ruhmann, Walter: Ueber den Weichteilrheumatismus, Acta rheumatol. **2**: 29 (Sept.) 1930.

3. Müller, Otfried: Die Kapillaren des menschlichen Körperoberfläche in gesunden und kranken Tagen, Stuttgart, 1922.

4. Klingmüller, Manfred: Ueber die Scheitelkügelchen der Nagelpfalzcapillaren, Ztschr. f. d. ges. exper. Med. **55**: 808, 1927.

5. Lunedei, A., and Corradini, G.: Les troubles de la circulation de la peau dans les affections rheumatismales chroniques, Acta rheumatol. **2**: 2 (Nov.) 1930.

6. Weil, A. J.: Zur Frage des Anteils der Gefässe bei arthritischen Erkrankungen, Acta rheumatol. **2**: 47 (Nov.) 1930.

7. Prusík, Bohumil: Blood Circulation of the Skin in Rheumatism, Acta rheumatol. **2**: 17 (Nov.) 1930.

temperature was the finger nail fold. We observed the size, number and form of the capillaries, the blood flow within them, and the surface temperature. The equipment and methods used were those recently described by Duryee and Wright.[8] In addition, a complete physical examination, including a sedimentation test, was carried out in every case. The technic of the

TABLE 1.—*Study of the Capillaries in Chronic Arthritis*

	Number				Size			Form		Blood Flow				Surface Temp.	
					Rheumatoid Arthritis										
Age	Number	Normal	Decreased	Increased	Normal	Dilated	Constricted	Straight	Tortuous	Normal	Slow	Continuous	Interrupted	Normal	Subnormal
21-30	2	1	1	—	1	—	1	—	2	1	1	1	1	1	1
31-40	14	8	6	—	7	—	7	12	2	4	10	6	8	4	10
41-50	14	10	4	—	9	—	5	8	6	5	9	9	5	6	8
51-60	10	9	1	—	1	1	8	6	4	4	6	8	2	8	2
Total	40	28	12	—	18	1	21	26	14	14	26	24	16	19	21
					Osteo-Arthritis										
21-30	1	1	—	—	—	—	1	1	—	1	—	1	—	1	—
31-40	3	3	—	—	2	—	1	2	1	1	2	1	2	1	2
41-50	13	13	—	—	8	3	2	6	7	5	8	6	7	5	8
51-60	16	16	—	—	11	—	5	7	9	9	7	14	2	9	7
61-70	7	7	—	—	4	1	2	—	7	3	4	3	4	4	3
Total	40	40	—	—	25	4	11	16	24	19	21	25	15	20	20

determination of sedimentation rate was the same as described by Dawson, Sia and Boots;[9] the only modification was that we used, instead of 200 mm., 100 mm. pipets.

The patients were divided into age groups because of the physiologic changes characteristic of advancing years, which must be taken into consideration when looking for the pathologic lesions in chronic arthritis.

The classification of the capillaries into different groups was our most difficult problem. It is generally known that in physiologic conditions there may be in the same capillary field straight, tortuous, small and

TABLE 2.—*Sedimentation Rate of Chronic Arthritis Patients*

Type of Arthritis	Between 1-10 Mm. per Hour	Between 10-15 Mm. per Hour	Between 15-30 Mm. per Hour	Over 30 Mm. per Hour
Rheumatoid arthritis..	18%	41%	20%	21%
Osteo-arthritis.....	52.5%	23.8%	21.2%	2.5%

TABLE 3.—*Vasoneurotic State in Chronic Arthritis*

Type of Arthritis	Number	Vasoneurotic Patients	
		Number	Per Cent
Rheumatoid arthritis.....	40	6	15
Osteo-arthritis.....	40	2	5
	80	8	10

large capillaries, and changes in the rate of blood flow. Taking these facts into consideration, we classified our capillary results into definite groups only if over 70 per cent of the capillaries were of a specific type. We also examined several capillary fields in different fingers before a definite conclusion was drawn. Up to the present time we have no satisfactory method for the exact measurement of the rate of the blood flow. It may be stated that the flow is slow if it is possible to see the blood cells distinctly passing slowly through the capillaries.

To measure the continuity of the flow, we used, in cases in which we found longer interruptions, the two-minute flow test; i. e., we measured the time of the actual flow in two minutes. We had several cases in which the two-minute flow test was under 90 seconds; in normal conditions it is over 110 seconds.

The capillary picture at the finger nail fold in the different types of arthritis is shown in table 1.

In 30 per cent of the rheumatoid arthritic patients there was a decrease in the number of capillaries. In 52.5 per cent we found small constricted capillaries. There was slow blood flow in 65 per cent of the cases; the capillaries were tortuous in 35 per cent, the surface temperature was subnormal in 52.5 per cent.

In osteo-arthritis the capillary picture was in some respects different. There is a decrease in number of capillaries only in fingers with pronounced Heberden's nodes. The size of capillaries was small in 27.5 per cent. The percentage of occurrence of slow blood flow was decreased to 52.5 per cent. The frequency of tortuosity of the capillaries was increased to 60 per cent. The surface temperature was subnormal in 50 per cent of these patients.

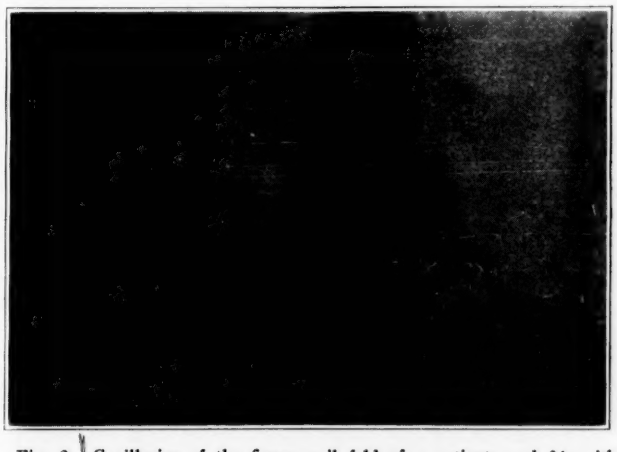

Fig. 2.—Capillaries of the finger nail fold of a patient aged 34, with osteoarthritis. Dilated and constricted capillaries in the same field as described in Müller's vasoneurotic state. From an unretouched photomicrograph, enlarged from a 35 mm. film with a magnification of 176 diameters.

The results obtained in the sedimentation tests are shown in table 2.

A vasoneurotic state, as described by Otfried Müller, was found in 15 per cent of rheumatoid arthritis and in 5 per cent of osteo-arthritis (table 3).

COMMENT

An analysis of the results of our study demonstrated that the density of the capillary bed varied in every individual to some degree. We found a definite decrease in the number of capillaries only in rheumatoid arthritic patients on the skin above joints with definite swellings, and in osteo-arthritic patients with pronounced local tissue changes, such as Heberden's nodes. Fingers with Heberden's nodes have a distinctly decreased number of capillaries which are constricted, reducing the extent of the capillary bed. This has a fundamental bearing on tissue nutrition. We could not determine whether this disappearance of the capillaries is responsible for

8. Duryee, A. W., and Wright, I. S.: Modern Technic for the Study of Human Capillaries, Am. J. M. Sc., to be published.

9. Dawson, M. H.; Sia, R. H. P., and Boots, R. H.: The Differential Diagnosis of Rheumatoid and Osteo-Arthritis: The Sedimentation Reaction and Its Value, J. Lab. & Clin. Med. **15**: 1065 (Aug.) 1930.

the tissue changes, or whether the tissue changes cause the decrease in the capillaries.

The size of the capillaries varied within the different arthritic groups. Small constricted capillaries were found in 52 per cent of the cases of rheumatoid arthritis in comparison to the occurrence of 27.5 per cent in osteo-arthritis. This is perhaps due to the constitutional makeup of the individual, the congenital disturbance of equilibrium between the sympathetic-parasympathetic system causing a widespread increase in the arteriolar and capillary tone. If Nordmann's[10] and Woollard's[11] descriptions of a nerve supply enervating the Rouget cells are accepted, the stimulation of such nerve fibers may be the cause of the contraction of the capillaries.

Fig. 3.—Capillaries of the finger nail fold of a patient, aged 45, with rheumatoid arthritis. The marked variation in morphology in the photomicrographs in figures 1, 2 and 3 may be noted. From an unretouched photomicrograph, enlarged from a 35 mm. film with a magnification of 176 diameters.

But, on the other hand, the study by Brown[12] on the capillaries of the human skin shows that the nervous innervation is not alone responsible for the contractility of capillaries. He found that cervical ganglionectomy did not dilate the capillaries in any case of arthritis.

It seems that, besides the nervous innervation, general or local physicochemical components may also influence the tonus of the capillaries.

We found an increased tortuosity in 60 per cent of the cases of osteo-arthritis in comparison to 35 per cent in rheumatoid arthritis. We believe that this is a physiologic phenomenon and is due to the higher age average. Numerous studies by different research workers show that, parallel with the age, the tortuosity of capillaries increases. The average age of rheumatoid patients was 44; the youngest 24, the oldest 60. In comparison, the average age of osteo-arthritis was 53; the youngest 27, the oldest 69.

We could not find any connection between the tortuosity of the capillaries and the severity of the clinical symptoms.

The velocity and continuity of the blood flow gave nearly the same results in the different types of arthritis. We found a slow blood flow in 65 per cent of the patients with rheumatoid arthritis and in 52.5 per cent of those with osteo-arthritis. Most patients with severe clinical symptoms had a slow blood flow.

We found a close connection between sedimentation and rate of capillary blood flow. In all cases in which we found a high sedimentation rate we found also a slow blood flow. The fact that an increased sedimentation is parallel with increased viscosity is evidence in favor of the conclusion that the rate of blood flow in the capillary circulation is influenced somewhat by the viscosity (physicochemical changes) of the blood. It was impossible to find any connection between the rate of blood flow and the tonus and form of capillaries.

We could not find any connection between the continuity of the blood flow and the sedimentation rate.

The surface temperature in 51.25 per cent of the chronic arthritic subjects was on an average lower than that of normal persons. This explains why arthritic patients often complain of numbness and cold hands and feet. The surface temperature, Foged[13] reports, ranges in normal persons, measured on the finger nail bed, between 32 and 33 C. We found in rheumatoid arthritic patients the lowest temperature to be 20.2 C.; in osteo-arthritis, 22.2 C.

All arthritic patients who had a low surface temperature had a slow and sometimes interrupted blood flow. It seems to us that the temperature of the finger nail bed under similar outstanding conditions varies according to the blood flow. In figure 4 the curves of the surface temperature and of slow blood flow are nearly parallel. We found the average lowest temperatures in rheumatoid arthritis between the ages of 31 and 40, and in osteo-arthritis between the ages of 41 and 50.

CONCLUSION

As observed in this series:

1. In the region of pronounced tissue changes such as are found in Heberden's nodes and swelling of the joints, we observed a definite decrease in the number of capillaries.

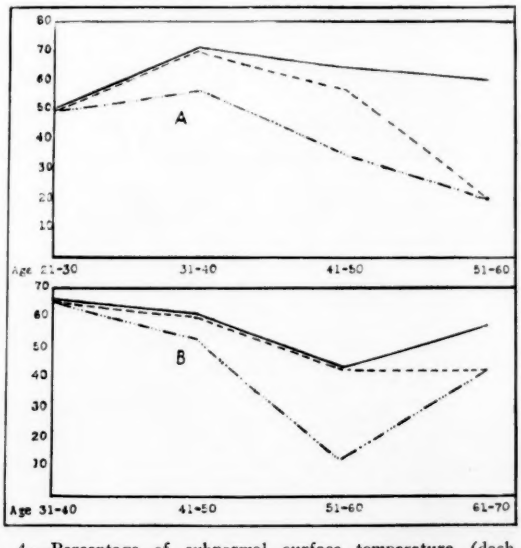

Fig. 4.—Percentage of subnormal surface temperature (dash line), slow blood flow (solid line) and interrupted blood flow (dot-and-dash line) according to age in *A*, rheumatoid arthritis and *B*, osteo-arthritis.

2. In the rheumatoid type of arthritis there is a higher percentage of small constricted capillaries than in osteo-arthritis, owing possibly to the constitutional makeup of these individuals.

10. Nordmann, M.: Studien am Fettgewebe, Ztschr. f. d. ges. exper. Med. **48**: 84, 1925.

11. Woollard, H. H.: The Innervation of Blood Vessels, Heart **13**: 319 (Dec.) 1926.

12. Brown, G. E.: Observations on the Surface Capillaries in Man Following Cervicothoracic Sympathetic Gangliectomy, J. Clin. Investigation **9**: 115 (Aug.) 1930.

13. Foged, Yens: The Normal Circulation of the Blood Through the Skin, Acta rheumatol. **2**: 5 (Sept.) 1930.

3. In the cases observed, the rheumatoid type of arthritis has in 52.5 per cent, the osteo-arthritis in 50 per cent, lower surface temperature than the normal.

4. All patients with a low surface temperature have a slow capillary blood flow.

5. Increased sedimentation rate is always associated with a slow blood flow and a lowered surface temperature.

6. The presence or degree of severity of the arthritis is not constantly reflected in the capillary or temperature changes.

7. Although changes from normal do occur in the skin capillaries and skin temperature in many cases of rheumatoid arthritis and osteo-arthritis, because of the lack of consistency in these observations we cannot consider that they are uniformly responsible for the pathologic changes found in these conditions. Furthermore, it is not established that the condition of the capillaries of the nail fold is paralleled by the condition of the capillaries supplying the joints.

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CARCINOMA OF THE EPIDIDYMIS

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The infrequent occurrence of malignant tumors in the epididymis, particularly carcinoma, can be judged by the paucity of literature on the subject. Recently we found a case of primary cancer of the epididymis in the course of our routine work. We looked up the literature on the subject, as we had never seen a case before. To our surprise we found only twenty-one cases of primary malignant tumors of the epididymis reported, of which fifteen are sarcomas or teratomas of various sorts and six carcinomas. Three of the six are of doubtful histologic descriptions for carcinoma, which leaves only three authentic primary cancers in this organ as far as we could find. Undoubtedly more cases had occurred than those found reported, but such a small number in the world's literature indicates the rarity of the occurrence.

The most comprehensive contribution on the subject was made by Hinman and Gibson.[1] They reported three cases from the literature: Wrobel's case,[2] a case reported by Rowlands and Nicholson,[3] and another case by Sakaguchi.[4] The description of Wrobel's case does not fully convince us that it was a true carcinoma. These authors reported a case of their own which they thought was cancer, and Ewing, Bloodgood and Ophüls took the same view, although there was some difference of opinion among other pathologists. They also cited a case reported by Stout[5] as being a possible precancerous lesion.

Among other investigators, Coleman, Mackie and Simpson[6] reviewed the literature and reported a case of primary carcinoma of the epididymis of embryonal origin. They found only twenty-one cases of malignant tumor of the epididymis in the literature, including those cited by Hinman and Gibson. Fifteen of the twenty-one cases were reported as sarcoma of various kinds and six were reported as carcinoma: two squamous cell, one basal cell, one columnar cell, and two of the adenomatous type.

Besides these two reports there are a few others that were not cited by them: Blumer,[7] a case of sarcoma of the epididymis found at autopsy; Castaño and Astraldi,[8] a case of embryoma malignum; Comfortti[9] a case of lymphosarcoma; Kraft,[10] a case of small cell lympho-angiosarcoma; Thompson-Walker,[11] a case of myosarcoma; Scotti Douglas,[12] a case of fusocellular sarcoma; in the *Transactions of St. Thomas Hospital* a case of round cell sarcoma was reported[13] but the name of the author is not given. The older literature contains a few reports of sarcoma, but the diagnoses should be accepted with reservation.

Fig. 1.—Epididymis and testis, bisected. The applicator indicates the course of the ductus epididymidis; the lumen of the lower portion is occluded. *X*, location of tumor.

REPORT OF CASE

J. H. Y., a white man, aged 34, admitted to the hospital, Oct. 10, 1932, complained of pain in the region of the left testicle. The patient's mother died from carcinoma of the cervix at the age of 47. During the war he was thrown from the horse he was riding and fell on a fence, injuring the left testicle and prostate. He was operated on for the injury and made an uneventful recovery. He was free from any symptoms until a few days before his admission to the hospital, when he began to have urethral discharges, which persisted irregularly in spite of treatments. The pain became

1. Hinman, Frank, and Gibson, T. E.: Tumors of the Epididymis, Spermatic Cord and Testicular Tunics, Arch. Surg. **8**: 100-137 (Jan.) 1924.
2. Wrobel, August: Beiträge zur Kenntnis der malignen Hodengeschwulste, Breslau, 1902.
3. Rowlands, R. P., and Nicholson, G. W.: Lancet **1**: 304, 1909.
4. Sakaguchi, Y.: Frankfurt Ztschr. f. Path. **15**: 12-78, 1914.
5. Stout: Proc. New York Path. Soc. **17**: 129-137, 1917.
6. Coleman, J. A.; Mackie, H. A., and Simpson, William: Tr. Chicago Urolog. Soc. **1**: 31-36, 1931; Surg., Gynec. & Obst. **55**: 111-116 (July) 1932.
7. Blumer: Albany M. Annals **18**: 592; **19**: 315, 1897.
8. Castaño, E., and Astraldi, A.: Rev. de especialid **1**: 660-668, 1926.
9. Comfortti, Morgagni: **3**: 301-372, 1910.
10. Kraft: Inaug. Diss., Würzburg, 1904.
11. Thompson-Walker: Proc. Roy. Med. Soc. London, Sect. Urol. **16**: 3, 1922-1923.
12. Scotti Douglas, R.: Boll. d. spec. med.-chir. **4**: 244-256, 1930.
13. Tr. St. Thomas Hospital, London **34**: 219, 1906.

very severe, October 8, and on the advice of his physician he came to the hospital two days later. Physical examination showed that the left testicle was swollen to the size of an orange and was very tender to the touch. In a short while the swelling subsided and the pain eased somewhat, but it was still very tender. A tentative diagnosis of epididymitis was made, and epididymectomy and orchectomy were done by one of us (E. V. J.).

The gross examination of the tissues showed that the testis was atrophied but the epididymis was markedly thickened. The whole mass, including the testis and the epididymis, measured 6 cm. in length, 5.5 cm. in width and 2.5 cm. in thickness. The epididymal portion was more than 2.5 cm. wide and was thicker than the testicle portion. A white glistening fibrous nodule of irregular shape, the size of a small chestnut, was found among dark dense fibrous stroma, without capsule, at the lower third of the body of the epididymis, very near the globus minor. The nodule was on the lower part of the ductus epididymidis and vas aberrans but not involving the testis, as the tunic covering it was intact. However, several fine white bands radiated from the central nodule and infiltrated into the surrounding dark stroma. The cut surface of the nodule presented a white, smooth, glistening appearance, streaked here and there with capillary hemorrhage.

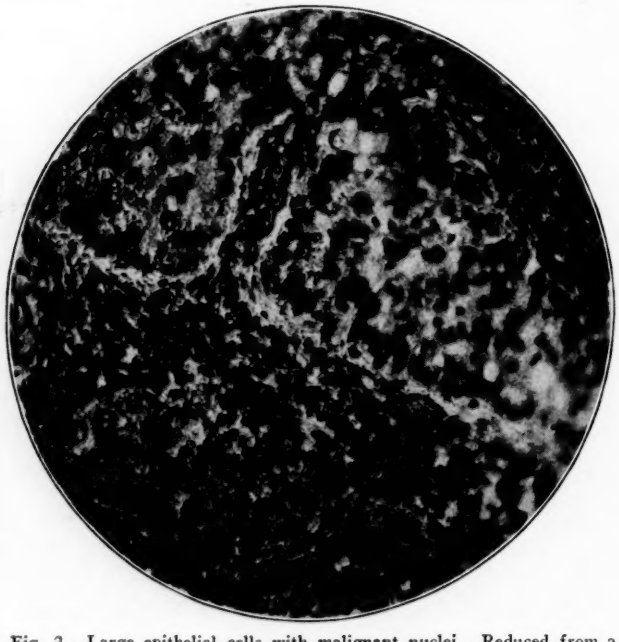

Fig. 2.—Large epithelial cells with malignant nuclei. Reduced from a photomicrograph with a magnification of 440 diameters. Hematoxylin and eosin stain.

Under a low power objective the tissue showed numerous alveolar formations by fibrous bands, and these alveoli were filled with anaplastic epithelial cells which suggested a slight keratinization in some areas, resembling squamous cells. Some were cuboidal, containing hyperchromatic nuclei with scanty cytoplasm. Mitotic figures could be seen occasionally. The cells in the stroma were smaller and round or ovoid but also hyperchromatic and scant in cytoplasm. In certain fields the large epithelial cells infiltrated rather diffusely when they were not confined by the fibrous wall of alveoli.

The location of the tumor nodule and the total obliteration of the lower portion of the ductus epididymidis in the gross specimen and the character of the epithelial cells led us to believe that they were originated from the lining cells of the duct at the lower part of the body of the epididymis. Judging from the histologic description, the tumor in the case reported by Rowlands and Nicholson [3] is very much like ours, and they called it squamous cell carcinoma. The cells look like the squamous variety in our case also, but we believe they are the metaplastic lining cells of the epididymal duct. The presence of inflammatory products in the neighborhood of the tumor nodule indicates that there had been a chronic irritation, probably due to some damage of the epididymis, unrecognized at the time of the injury to the testicle. According to the last report, about two months after the operation, the patient was doing as well as could be expected and showed no metastasis elsewhere.

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CASE STUDIES IN CHRONIC ARACHNOIDITIS

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AND
ROBERT ZOLLINGER, M.D.
BOSTON

The neurologic surgeon is forced from time to time to operate without perfect localizing signs and without full appreciation of what the pathologic condition may be. He may even be said to be forced into such action more frequently than his general surgical colleagues through threatened loss of vision or other serious and urgent symptoms. It is thus that every neurologic surgeon of experience has accumulated many cases which he must classify as "tumor suspect" or "pseudotumor" cases. Out of these groups in the last twenty years have emerged certain definite clinical entities and disorders. One of these is a symptom complex produced by blockage in the cerebrospinal pathways after the cerebrospinal fluid has escaped from the internal ventricular system. This condition is generally accepted and classified under the term "chronic arachnoiditis," though it is sometimes called "active external hydrocephalus" [1] as differentiated from that type of internal ventricular system blocking which results in the commonly recognized condition of hydrocephalus.

This condition is, however, by no means entirely new in the sense that it had not long previously been described, for in the papers written by John Hilton [2] and published after his lectures at the Royal College of Surgeons of England in 1860, 1861 and 1862 in the volume entitled "Rest and Pain," there is a perfect description of a patient, dying at the age of 34, whose history as well as the conditions found at a postmortem examination would be familiar to all neurologic surgeons of today. Hilton's patient died rather suddenly after a day of severe headache and staggering gait, obviously from medullary pressure. In the history are many interesting points, for from childhood he had been subject "to headache, derangement of stomach and occasional deafness. . . . His pulse was usually extremely weak, irregular and slow." He had been thought to be suffering from heart disease. He had a "peculiar, restless, uneasy look of the eyes and stare, with dilated pupils. . . . He also carried his head peculiarly as if affected with slight stiffness in the neck. A few months before his death, while in the country, he had a severe attack of vomiting." The day he died he had great difficulty in walking, staggered badly, felt giddy, went to bed and died shortly with marked symptoms of stertorous breathing.

The autopsy showed enlarged ventricles lined with healthy tissues. "The cerebrospinal opening between the under surface of the cerebellum and the upper surface of the medulla oblongata was completely closed

From the Department of Surgery, Lakeside Hospital, Cleveland.

1. Gardner, W. T.: Active External Hydrocephalus: A Report of Three Cases, J. Nerv. & Ment. Dis. **75**: 601-611 (June) 1932.
2. Hilton, John: Rest and Pain, ed. 3, London, George Bell & Sons, 1880.

by a tolerably dense membranous structure, which formed a kind of pouch projecting downwards, and showed the direction of the fluid tension upon it to have been from above to below. . . . The arachnoid in the neighborhood, at the base of the brain, was somewhat opaque and thicker than natural."

Hilton, in writing up this case, apparently felt the need of protecting himself from criticisms of his colleagues as some neurologic surgeons feel they must do today when making the diagnosis of arachnoiditis, for he writes into the report that "this account has not been 'cooked'," as apparently such matters were termed in his day. The description of this case of Hilton's should give courage to others to report similar cases, so that the symptom complex which relates to this condition may be more thoroughly understood and appreciated.

It seems to us that adhesions, resulting from a chronic inflammatory reaction in the arachnoid, might bring about local encystment of the cerebrospinal fluid or interfere with its free circulation to such an extent as to produce symptoms simulating a tumor of the brain or of the spinal cord. Emphasis has been placed on two definite clinical syndromes produced by this mechanism. In one condition, chronic cisternal arachnoiditis in the middle fossa has produced symptoms that could not be differentiated from tumor involvement of the optic nerves and chiasm. The cases reported by Heuer [3] were characterized by a primary optic atrophy and the accompanying limitation of vision, and by other clinical manifestations of intracranial disease. Craig and Lillie [4] have also called attention to this syndrome and have reported eight cases. These authors state that the patients in their series were usually improved following the freeing of adhesions about the chiasm and the evacuation of encysted cerebrospinal fluid.

The more common syndrome of "pseudotumor" resulting from a generalized cisternal arachnoiditis is that of cerebellar dysfunction. Horrax [5] reported thirty-three cases with symptomatology pointing toward a cerebellar tumor. He divided the cases into (*a*) acute or subacute, (*b*) chronic and (*c*) those with a preceding history of otitis media. Twenty-eight of these patients were improved or well from one to nine years after operation. Frazier [6] classed 30 of his 1,209 cases as arachnoiditis or "pseudotumor." Twenty-two of these cases were followed at least two years, and one patient remained symptom free for twenty-five years after operation.

The diagnosis of chronic arachnoiditis is rarely made before operation. Although at operation a histopathologic change in the arachnoid membrane may be found without the discovery of a neoplasm, still the diagnosis of chronic arachnoiditis or "pseudotumor" cannot be made with certainty until a prolonged period of relief has passed. Davis and Haven [7] believe the diagnosis of arachnoiditis should not be made but that the patients should be classed as tumor suspects and remain under close observation.

3. Heuer, G. J., and Vail, D. T., Jr.: Chronic Cisternal Arachnoiditis Producing Symptoms of Involvement of the Optic Nerves and Chiasm: Pathology and Results of Operative Treatment in Four Cases, Arch. Ophth. **5**: 334-349 (March) 1931.

4. Craig, W. M., and Lillie, W. I.: Chiasmal Syndrome Produced by Chronic Local Arachnoiditis: Report of Eight Cases, Arch. Ophth. **5**: 558-574 (April) 1931.

5. Horrax, Gilbert: Generalized Cisternal Arachnoiditis Simulating Cerebellar Tumor: Its Surgical Treatment and End-Results, Arch. Surg. **9**: 95-112 (July) 1924.

6. Frazier, C. H.: Cerebral Pseudotumors, Arch. Neurol. & Psychiat. **24**: 1117-1132 (Dec.) 1930.

7. Davis, Loyal, and Haven, H. A.: A Clinicopathologic Study of the Intracranial Arachnoid Membrane, J. Nerv. & Mental Dis. **73**: 129 (Feb.), 286 (March) 1931.

We believe that chronic arachnoiditis is a definite clinical entity which responds very favorably to surgical intervention. This belief is exemplified in the three cases which we present in this report. All three patients had increased intracranial pressure, marked loss of vision, and symptoms suggestive of a subtentorial block. The patients now have good vision and have remained symptom free for a period of over six years after suboccipital exploration was carried out. The cases are taken from a large group of tumor suspect cases and reported in detail as typical examples of this syndrome. Since in each case more than six years has passed since the original operation, tumor can hardly be argued as a possible etiologic factor.

REPORT OF CASES

CASE 1.—*History.*—S. S., a white boy, aged 9 years, entered the Lakeside Hospital, Oct. 11, 1926, because of blindness and headaches. Nine days before admission he complained of a severe frontal headache. Close questioning showed that the child might have had headaches for several months previously. The father stated that recently the child had been feverish and restless and had had great difficulty in emptying his bladder. The patient improved and the fever subsided following treatment by the family physician. Seven days later (two days before admission to the hospital), the boy complained that he could not see the "funny paper." At the time he was admitted to the hospital there was scarcely more than perception of light.

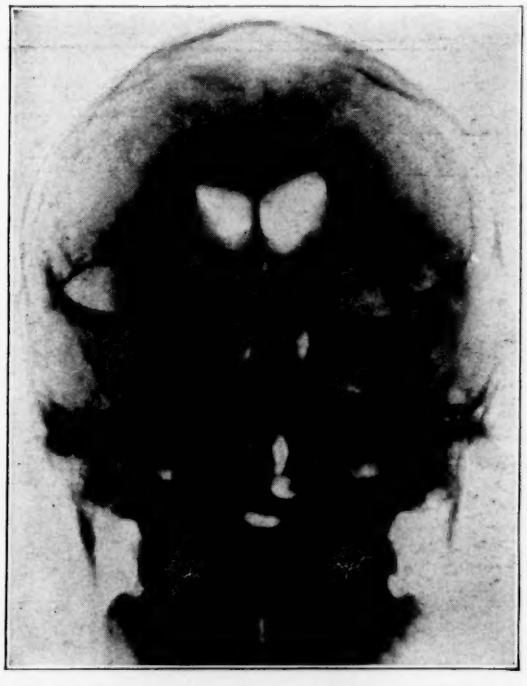


Fig. 1.—Anteroposterior view of encephalogram in case 1. The third and lateral ventricles are enlarged but not displaced.

The family history was good. The patient had had chickenpox at the age of 1 year and whooping cough at 5 years of age.

The boy's face was characterized by the vacant stare of blindness. There was choking of both disks to 4 diopters. A definite cracked-pot note was elicited by percussion of the skull. The reflexes were hyperactive and about equal on the two sides. There was generalized weakness of the muscles with definite ataxia to the left. The bladder was markedly distended, and dribbling of urine was present. Roentgenograms of the skull gave evidence of a generalized increase in intracranial pressure. A preoperative diagnosis of a midline cerebellar tumor was made.

Operation and Result.—Under ether anesthesia the posterior fossa was explored, October 14. A cyst containing about 100 cc. of clear cerebrospinal fluid under great tension was encountered below the left lobe of the cerebellum. Following removal of this fluid the tension was greatly decreased, allowing exposure and inspection of both angles. The cerebellum appeared normal, and nothing unusual was noted when the hemispheres were needled. A presumptive diagnosis of basilar arachnoiditis was made.

After an uneventful convalescence, he was discharged from the hospital on the twenty-third postoperative day.

On request he reentered the hospital, March 28, 1932, about five and a half years after the operation, for a general check-up and encephalography. His general health had been good and he had remained free of symptoms. He was doing good school work in grade 6 B. The general physical and neurologic examinations gave perfectly normal results. His vision was good, although both optic disks were a little pale and the visual fields were slightly constricted. The blood Wassermann reaction was negative.

Fig. 2.—Anteroposterior view in case 2. The lateral ventricles are not displaced but the third ventricle is slightly dilated.

Encephalography was done on the day of admission. One hundred and twenty cubic centimeters of spinal fluid was removed and 90 cc. of air was injected into the lumbar space. The spinal fluid Wassermann reaction was negative and the Lange curve normal. Encephalograms showed both lateral ventricles to be slightly enlarged but symmetrical and not displaced (fig. 1). The left ventricle was slightly larger than the right and the pontile cisterna was well shown. The cortical markings were definitely diminished.

CASE 2.—*History.*—E. C., an intelligent but nervous white boy, aged 9 years, was referred to the Lakeside Hospital, Nov. 4, 1925, by Dr. H. J. Gerstenberger because of vomiting and headaches. For two weeks before admission the boy complained of headaches over the left eye and about the base of the skull. Several days before admission the parents noticed that the left eye was turned slightly inward. During this time he had vomited frequently after eating. The vomiting increased during periods of constipation. Influenza was common where the boy lived and the local doctor thought the child might have had an attack at the onset of the present illness.

The boy was undernourished but well developed. He was able to walk and the Romberg test was negative. The back of the neck was very tender and stiff. There was some hypotonia in the lower extremities and very slight asynergy in the upper extremities. Both optic disks were choked to 4 diopters and there was evidence of partial paralysis of the left sixth nerve. A diagnosis of cerebellar tumor was made.

Operation and Result.—A suboccipital exploration was carried out, November 7. A distinct difference was noted between the two sides of the cerebellum. There was a darker, more translucent color beneath the dura on the left side, and the underlying lobe of the cerebellum could not be seen. A large quantity of cerebrospinal fluid spurted into the field from this area when the dura was opened because of an accumulation of fluid in the cisterna with greater extension to the left side. The lobes of the cerebellum appeared normal on inspection, palpation and needling. Nothing was found in either recess.

The immediate response to the operation was good, but cerebrospinal fluid reaccumulated. November 16, 65 cc. of slightly greenish cerebrospinal fluid was aspirated and similar amounts were withdrawn on two other occasions. The patient was given a series of high voltage roentgen treatments. His general condition seemed good, although he was a little irritable and complained of headaches at times. A hernia developed in the occipital wound and he was readmitted eight months later. At operation, June 26, 1926, an endothelial-lined cavity was found which covered both cerebellar hemispheres and easily contained about 200 cc. of cerebrospinal fluid. The hernia was repaired and the patient recovered rapidly. The outlines of the optic disks were indistinct but no choking was present.

In response to a request, he reentered the hospital for a neurologic examination and encephalography, March 28, 1932. His health had remained very good and his only complaint was an occasional mild headache. He had been doing good school work in the sixth grade. The only positive observations were slight haziness of the margins of the optic disks; but there was no choking. Vision was good and the visual fields were not contracted. The reflexes were not remarkable.

Ninety-five cubic centimeters of spinal fluid was withdrawn and 80 cc. of air injected intermittently. Encephalograms showed the lateral ventricles to be normal in size, contour and position and the third ventricle to be slightly dilated (fig. 2).

CASE 3.—*History.*—C. S., an intelligent single white youth, aged 19 years, was admitted to the medical service of the Lakeside Hospital, Aug. 19, 1926, complaining of attacks of headaches for the past six or seven years. These attacks had become more frequent and more severe for six months until they were finally present day and night the month before admission. He obtained some relief by lying down and hanging his head over the edge of the bed. The severe headaches were accompanied by nausea, vomiting, diminution in vision and dizziness. He had noticed a peculiar buzzing in his ears, which was more marked on the right side. There had been no staggering, motor or sensory disturbances.

The positive observations were bilateral choking of the optic disks to 3 diopters and evidence of increased intracranial pressure as shown in roentgenograms of the skull. The sella turcica was quite large and the posterior clinoids were partially destroyed.

The patient was transferred to the surgical service, August 27. The history, physical examination and roentgenograms of the skull suggested a pituitary tumor or a suprasellar cyst.

Operation and Result.—Because of the absence of localizing signs, a right subtemporal decompression was performed, August 28, by Dr. Allen Graham. Almost within twenty-four hours the decompression wound was tense and the intracranial pressure was probably as great as before the operation. September 25, 60 cc. of spinal fluid was removed by inserting a ventricular needle through the subtemporal decompression wound. At the same time 25 cc. of air was injected by lumbar puncture. A small amount of air reached both lateral ventricles, showing that the cerebrospinal pathways were not completely blocked. October 2, 40 cc. of fluid was replaced by air through a ventricular needle inserted through the area of decompression. Ventriculograms showed enlarged but not

distorted lateral ventricles. A cerebellar exploration was carried out, November 5. It was thought that the pia was a little thickened, but the exploration was otherwise entirely negative.

The postoperative course was uneventful and the patient was discharged from the hospital, November 23.

By request he reentered the hospital, March 4, 1932, almost five and a half years after the suboccipital exploration, for a check-up and encephalography. He had recovered completely and remained symptom free. Vision in both eyes was good and the optic disks were normal in appearance. The neurologic examination was negative.

Examination of the spinal fluid showed 3 cells per cubic millimeter and a negative Pandy reaction. The Wassermann reaction was negative. The total protein was 21.3 mg. per hundred cubic centimeters. One hundred and seventy-five cubic centimeters of spinal fluid was removed and 150 cc. of air injected. Encephalography showed the ventricles to be slightly enlarged but normal in contour and position (fig. 3). The air was distributed equally in the cortical pathways over the two hemispheres.

Fig. 3.—Anteroposterior view in case 3, showing moderately dilated but not displaced ventricles.

COMMENT

We believe that these patients have remained symptom free for a sufficient number of years to make the diagnosis of intracranial tumor unlikely. Furthermore, by encephalography the ventricles were found to be symmetrical in outline and position. This finding gives further conclusive evidence against the presence of tumor, which in a period of more than six years would have produced some distortion of the ventricular system. The accumulation of cerebrospinal fluid in the posterior fossa probably results from partial obstruction by scar tissue in the subarachnoid channels at the level of the tentorium. Experimentally, Dandy [8] has produced hydrocephalus by causing adhesions about the incisura tentorii which blocked the free flow of cerebrospinal fluid upward from the posterior fossa. This, he believes, limits the absorption of the cerebrospinal fluid to one fifth of the total arachnoid space. Perhaps a low-grade infection, such as influenza, might produce adhesions in the cisterna of these patients and a subtentorial block with the resulting accumulation of cerebrospinal fluid in the posterior fossa. A suboccipital decompression gives relief by creating additional space during the periods of excessive formation and accumulation of the cerebrospinal fluid, and permits the gradual but continuous passage of the fluid so that in time of lessened secretion the excess accumulated passes by the blocked area and no great pressure is exerted. Thus, a suboccipital decompression in such cases acts merely as a safety valve.

8. Dandy, W. E.: Experimental Hydrocephalus, Ann. Surg. **70:** 129-142 (Aug.) 1919.

SUMMARY

In three cases of "pseudotumor" or chronic arachnoiditis in which there were symptoms of highly increased intracranial pressure, blindness or poor vision, and evidence of cerebellar dysfunction, the patients have remained symptom free with good vision for more than six years after suboccipital decompression. There is no evidence of intracranial tumor, as shown in recent encephalograms.

Peter Bent Brigham Hospital.

Clinical Notes, Suggestions and New Instruments

HYPOTHYROIDISM ASSOCIATED WITH CARDIAC ENLARGEMENT ("MYXEDEMA HEART") AND AURICULAR FIBRILLATION

JOHN E. WALKER, M.D., OPELIKA, ALA.

Cardiac enlargement associated with hypothyroidism was first described by Zondek.[1] Ayman, Rosenblum, and Falcon-Lesses [2] recently reviewed the subject, collecting reports of twenty-two cases from the literature and reporting two cases of their own. Gotten [3] has since reported another case. Cardiac insufficiency was present in some of these patients. The cardiac insufficiency and enlargement disappeared after the administration of thyroid. Digitalis therapy was often given without benefit before the proper diagnosis had been made. The striking result produced by thyroid in this condition is paralleled only by the effect of vitamin B on the cardiac enlargement in beriberi, as described by Aalsmeer [4] and others.

This paper will describe another case of hypothyroidism with cardiac enlargement, apparently the twenty-sixth to be reported. The patient also emphasizes the fact that marked hypothyroidism may occur in slender individuals without the typical appearance of myxedema. Further, auricular fibrillation was present. Although auricular fibrillation is a frequent complication of hyperthyroidism, this is the first example, to my knowledge, of its association with hypothyroidism.

REPORT OF CASE

History.—The patient was a white man, aged 39, a machinist, seen, May 4, 1932, complaining of aching pains in the arms and legs and shortness of breath. He had been married twelve years; there were two children living and well; his wife had had no miscarriages. The family history was otherwise unimportant.

He had never had typhoid, rheumatic fever, dysentery or venereal disease. He had malaria in 1912. In 1918 he enlisted in the army, passing the physical examination without com-

1. Zondek, H.: Das Myxödemherz, München. med. Wchnschr. **65:** 1180 (Oct. 22) 1918; **66:** 681 (June 20) 1919.

2. Ayman, David; Rosenblum, Harold, and Falcon-Lesses, Mark: "Myxedema Heart" Without Evidence of Cardiac Insufficiency, J. A. M. A. **98:** 1721 (May) 1932.

3. Gotten, H. B.: Myxedema: A Case Report, Ann. Int. Med. **5:** 1492 (June) 1932.

4. Aalsmeer, W. C.: Herz und Kreislauf bei der Beri-beri-Krankheit, Wien. Arch. f. inn. Med. **16:** 193 (Jan. 20) 1929.

ment. His health was good during his army service except for influenza in France, which required hospitalization for thirty days. At the time of his routine physical examination incident to discharge from the army in 1919 he was told by the medical officer that his pulse was irregular and that he needed hospitalization for further study. He refused to enter a hospital, saying that he had no complaint, and his request for immediate discharge was granted. In 1921 he was refused for life insurance on account of irregular pulse. Since that

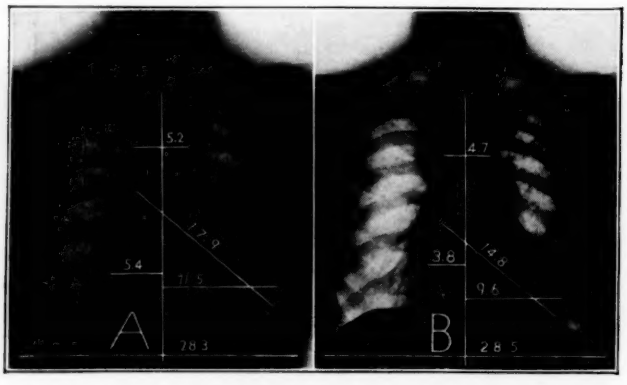


Fig. 1.—Measurements of heart: *A*, before thyroid therapy; *B*, after thyroid had been taken for five months.

date he has been aware of irregular pulse all the time, determined by feeling of it. There has been no subjective consciousness of an irregular heart. He had another attack of influenza four years before the time of examination.

About 6 years before, he noted that he did not perspire. On hot days his fellow workers would be drenched with perspiration, while his own skin remained perfectly dry. He had also been cold natured. These complaints were brought out by leading questions, and the patient had attached no particular significance to them. He suffered from constipation for years.

He considered that his present illness began two years before, when he broke down physically following a period of several weeks during which he attempted to work from fifteen to eighteen hours a day. He became weak and suffered from dizziness and shortness of breath. He had not been able to work since, though he had been up and about most of the time. During the past two years he had suffered almost constantly from deep aching pains in the arms and legs. All of his teeth were pulled in the effort to correct this aching, which had been diagnosed as arthritis. A year before, he entered a hospital, where a roentgenogram showed enlargement of the heart. He was given digitalis without benefit and left the

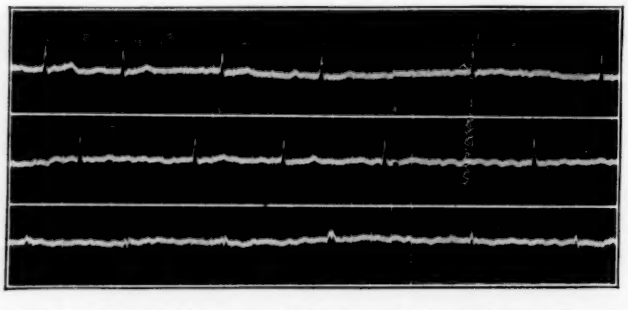


Fig. 2.—Condition before thyroid therapy: auricular fibrillation; T waves almost iso-electric.

hospital after two weeks. He had been forgetful. His feet had been moderately swollen from time to time.

Examination.—The patient was slender, 70½ inches (178 cm.) tall and weighing 150 pounds (68 Kg.). The skin was of a yellowish, pasty color. There was slight puffiness of the lower lids. There was a raised erythematous desquamating area about 4 by 8 cm. on the extensor surface of the left forearm. There was no edema. The axillae were dry.

The pulse was totally irregular in force and rhythm, with a rate of 60, and no pulse deficit. The blood pressure was approximately 140 systolic, 80 diastolic. The apex impulse was not visible nor palpable. The area of relative cardiac dulness was enlarged. There were no heart murmurs.

A teleroentgenogram of the heart showed transverse enlargement (fig. 1 *A*). The measurements were: midline to right border, 5.4 cm.; to left, 11.5 cm.; transverse diameter, 16.9 cm.; internal diameter of the thorax, 28.3 cm. (16.9 ÷ 28.3 = 60 per cent); length, 17.9 cm.; great vessels, 5.2 cm. The electrocardiogram showed auricular fibrillation, rate 54. The T waves were almost iso-electric (fig. 2).

Fluoroscopic examination of the gastro-intestinal tract was negative. The gastric contents after an Ewald meal contained no free hydrochloric acid on two examinations. There was no occult blood in the stool. The urine contained a trace of albumin, no bile, urobilinogen, sugar or casts; the specific gravity was 1.017. The icterus index of the blood serum was 6. The Wassermann and Kahn tests were negative.

The basal metabolism was minus 41 per cent.

The red blood count was 3.9 millon, hemoglobin, 73 per cent; white blood cells, 4,500; neutrophils, 54 per cent; eosinophils, 4 per cent; basophils, 1 per cent; lymphocytes, 36 per cent; monocytes, 5 per cent. The red blood cells appeared normal on smear.

Course.—The patient was given 1 grain (0.065 Gm.) of thyroid, U. S. P., a day, the daily dosage being increased 1 grain each week until he was taking 4 grains (0.26 Gm.) a day. This dose was maintained until the end of the fifth week. The basal metabolism was minus *26*, minus *22* and minus 5 per cent at the end of the second, third and fifth weeks, respectively. Since then the basal metabolism has varied between minus 9 and plus 3 per cent on a maintenance

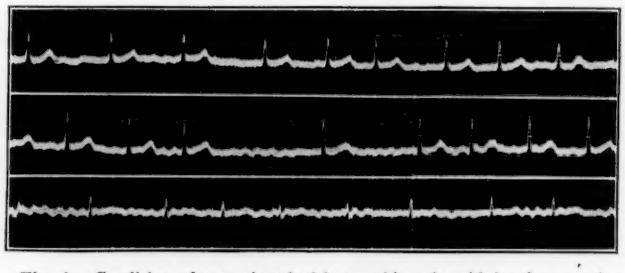


Fig. 3.—Condition after patient had been taking thyroid for five months: T waves much more pronounced; auricular fibrillation still present.

dose of from 2 to 2½ grains (0.13 to 0.16 Gm.) of thyroid daily. The patient, in addition, has received pills of ferrous carbonate and dilute hydrochloric acid, and has been instructed to eat a diet containing meat, green vegetables, milk and eggs.

At the end of three weeks there was an almost complete disappearance of the yellow pallor, and the skin lesion on his left forearm had healed. At the end of the fourth week he had begun to perspire normally. The troublesome aching pains also disappeared. His weight decreased to 138 pounds (62.6 Kg.) after five weeks of treatment but has since increased to 145 pounds (65.8 Kg.). Throughout the whole time of treatment the patient was ambulant, being seen only at the office. After three months he resumed his regular occupation and has worked eleven hours a day for five days a week since that time. (The total period of observation has been six months.)

Thyroid therapy had no effect on the auricular fibrillation, although the T waves became very much more prominent in the electrocardiogram (fig. 3). No effort was at first made to treat this arrhythmia, since it seemed desirable to ascertain whether it would not disappear under thyroid therapy. Recently quinidine sulphate in doses up to 15 grains (1 Gm.) a day has caused no change. I hesitate to give this ambulant patient full doses of quinidine, although this is recommended by Weisman.[5]

A teleroentgenogram showing the marked diminution in the size of the heart after five months' observation is shown in figure 1 *B*. The measurements are: midline to right border, 3.8 cm.; to left, 9.6 cm.; transverse diameter, 13.4; internal diameter of thorax, 28.5 cm. (13.4 ÷ 28.5 = 47 per cent); length, 14.8 cm.; great vessels, 4.7 cm.

5. Weisman, S. A.: Auricular Fibrillation: Ambulant Treatment with Quinidine, Arch. Int. Med. **49**: 728 (May) 1932.

SUMMARY AND CONCLUSIONS

An additional case of hypothyroidism associated with cardiac enlargement ("myxedema heart") was observed. The heart returned to normal size under thyroid medication. The heart condition was complicated by the presence of auricular fibrillation, on which thyroid had no effect. It appears entirely logical to consider that the auricular fibrillation was caused by the hypothyroidism, although it cannot be disproved that the arrhythmia was an independent condition of unknown etiology.

The slenderness of this patient emphasizes the fact that hypothyroidism is not necessarily associated with obesity. Other than slight puffiness of the lower lids and a yellowish pallor, his appearance or demeanor in no way suggested hypothyroidism. A typical history of hypothyroidism was brought out only by leading questions.

Dickson Building.

ELECTROCARDIOGRAPHIC OBSERVATION DURING CARDIAC PAIN

LOUIS FAUGERES BISHOP, M.D., AND LOUIS FAUGERES BISHOP, JR., M.D., NEW YORK

The opportunity of taking an electrocardiogram during an attack of cardiac pain occurs rather rarely in private practice. We were fortunate enough, recently, to have this experience in our office. The patient was a man, aged 48, who had had moderately severe precordial pain for fourteen hours previous to our observation. This pain was practically continuous and radiated to his left arm, as far as the elbow. It was unaccompanied by any other subjective symptoms. As he had been unable to obtain any symptomatic relief and suspecting the possibility of this being an attack of angina, he sought medical advice.

A history was obtained of his having had slight pain on exertion, particularly when walking, for the past three months. Otherwise he had been always well.

The physical examination was entirely negative except for a hypertension, the systolic blood pressure being 190 and the diastolic 100. Whether this was an accompaniment of his anginal attack or a preexisting condition it was impossible to say at the time. No leukocytosis was present. The temperature was normal. Other laboratory examinations, including a six-foot roentgenogram, urinalysis and a Wassermann test, gave no significant results.

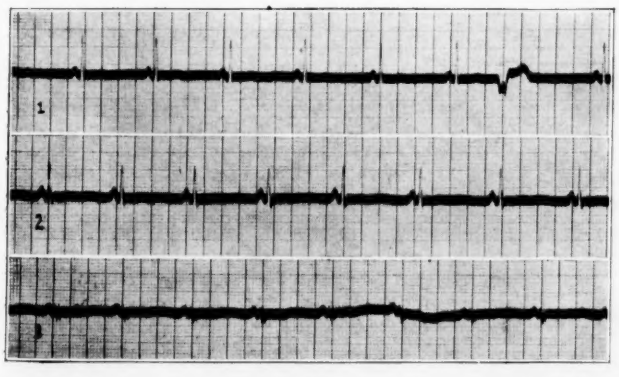


Fig. 1.—T wave iso-electric in all leads in record obtained June 17, 1932. Occasional ventricular extrasystole.

The first electrocardiographic examination was made on June 17, 1932, during this anginal attack. The significant finding was the fact that the T wave was iso-electric in all leads. In addition, there was an occasional ventricular extrasystole present (fig. 1).

Following this examination the patient was immediately put to bed for a period of rest. His pain gradually disappeared. The blood pressure fell to 130 systolic, 80 diastolic. No other physical signs or fever developed. No medication was given except mild sedatives. June 27, a second electrocardiogram was taken which showed further changes in the T wave, consisting of inversion in leads 1 and 2 (fig. 2).

Although the duration and severity of this attack of pain led to the probable diagnosis of a coronary thrombosis, it was not until the second graph was taken that we were able entirely to confirm the characteristic sequence of events representing the progression of pathologic events that had taken place.

As it is an exceedingly difficult matter to decide whether infarction of the heart has taken place or not during an attack of pain, it seems to us important that whenever an opportunity affords, attacks of cardiac pain, either of brief or of prolonged duration, should be studied electrocardiographically. The electrocardiogram actually taken during the paroxysm of pain in this case did show early changes in the T wave.

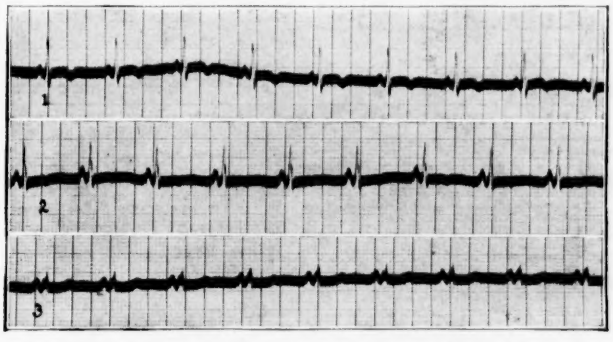


Fig. 2.—T wave inverted in leads 1 and 2 in record obtained June 27, 1932.

It is well known, as has been shown by Parkinson and Bedford,[1] Feil and Siegel,[2] and others, that even during short paroxysms of pain there may be definite and transitory changes in the ventricular deflections of the electrocardiogram. It is particularly significant that both transient pain and true infarction can affect the electrocardiogram in a similar manner. The mechanism underlying these changes may be essentially the same.

This case seems to us important because in the first place an opportunity was afforded to electrocardiograph a patient during an attack of actual cardiac pain in office practice. At the time of the attack, early changes in the T wave were noted. At a later date the electrocardiographic observations were those often seen in cardiac infarction. A diagnosis of cardiac infarction, although suspected clinically, could at a later date be confirmed electrocardiographically.

121 East Sixtieth Street.

HYPERPYREXIA WITH CORONARY THROMBOSIS

JOHN H. FOSTER, M.D., WATERBURY, CONN.

Fever and leukocytosis appearing shortly after the onset of symptoms are regarded as important points in the diagnosis of coronary thrombosis. The rise in temperature is quite constant, usually running from 99.6 to 102 or 103 F. for a few days to a week and is apparently due to absorption of the decomposition products from the necrosing muscle in the infarct area.

The unusually high fever in the case of coronary thrombosis recorded here seems to make it worth reporting:

F. L. S., an executive in a local foundry, was 44 years of age and had apparently been in excellent health. He had always been athletic, full of abundant energy and kept up his gymnastics, volley ball, and golf throughout the year. He was a rather heavy smoker and moderate user of alcoholic liquors. He had passed several examinations for life insurance during recent years. I examined him in 1930 for one company and found nothing definitely wrong. On a later check up, roentgenograms of his teeth were negative and the blood Wassermann reaction was negative, but he did have boggy red tonsils.

1. Parkinson, John, and Bedford, D. E.: Electrocardiographic Changes During Brief Attacks of Angina Pectoris: Their Bearing on the Origin of Anginal Pain, Lancet **1**: 15-19 (Jan. 3) 1931.

2. Feil, Harold, and Siegel, M. L.: Electrocardiographic Changes During Attacks of Angina Pectoris, Am. J. M. Sc. **175**: 255-260 (Feb.) 1928.

Business worries had been extreme and he had not taken a vacation the past year. During the week before the onset of his illness he had played through a local golf tournament. The day preceding he had felt substernal pain briefly during his match, which had been relieved by a short rest, but he slept well that night.

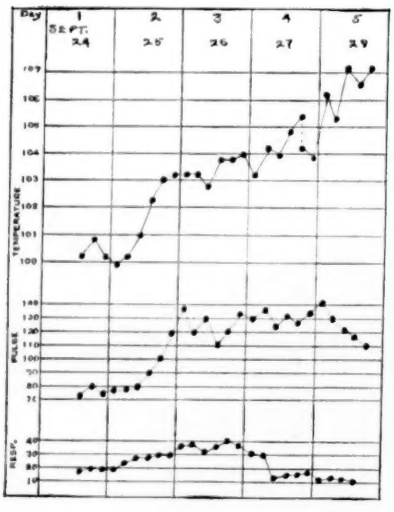


Fig. 1.—Clinical course, showing rise of temperature to 107.2 F.

On the morning of Sept. 24, 1932, he complained to one of his associates of a tightness in his chest. About 9:45 a. m., while alone on the third floor, he called to the telephone operator, who went to him as quickly as she could. He staggered across to the elevator and collapsed, complaining of terrible pain in his chest.

I saw him about fifteen minutes later. He was conscious, but was cold, clammy, pulseless and gray. The heart sounds were almost inaudible. The pain was apparently terrific all through the epigastrium, chest, neck and shoulders.

Morphine, one-half grain (0.03 Gm.), was given at once and repeated twice at about fifteen minute intervals before the pain was finally eased. Epinephrine, 0.5 cc., before the last

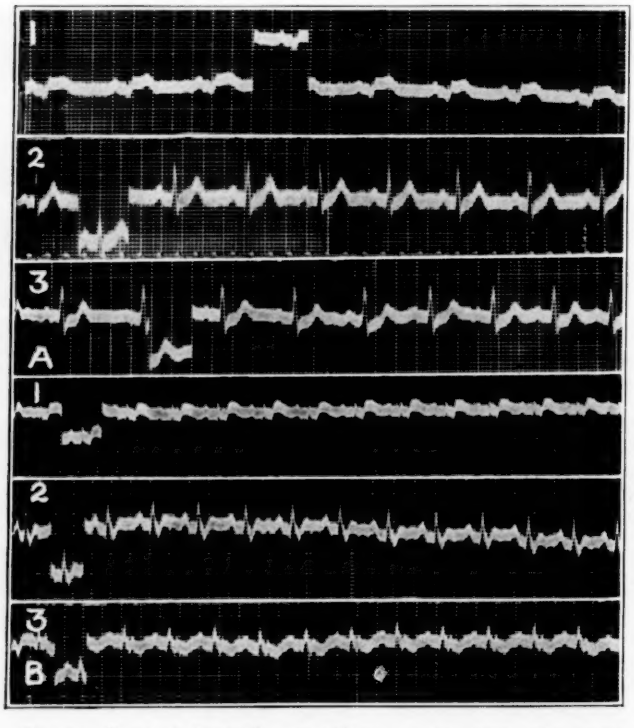


Fig. 2.—Signs of damaged myocardium: *A*, ten hours after onset; *B*, fifty-four hours after onset.

administration of morphine and again after about fifteen minutes seemed to increase the strength of his pulse and heart sounds. He slept quietly for three hours, when he was removed by ambulance to his home.

The temperature chart (fig. 1) shows graphically the course during the next four days. The severe pain did not return but he frequently complained of a feeling of substernal pressure, which was worse when the bladder was distended. He was unable to void urine and required catheterization till the end. Perspiration was profuse.

The heart sounds were very distant for the first hour but became stronger and more rapid. The second sound was replaced by a systolic murmur and there was gallop rhythm. No definite pericardial friction sounds were heard. The blood pressure varied, as is noted in the temperature chart, from being unobtainable at first to 130 systolic, 80 diastolic, the first day. The systolic pressure gradually dropped to 80 and to

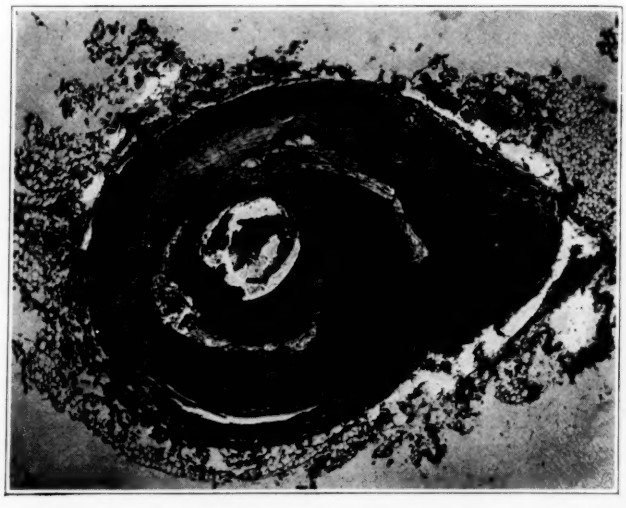


Fig. 3.—Section of coronary artery showing sclerosis, arteritis and thrombus.

60 during the last two days. The lungs remained clear and there was only slight abdominal distention.

The leukocyte count was 20,300, with 85 per cent polymorphonuclears on the 25th and 16,000 on the 27th. The urine was concentrated but otherwise normal.

With the rise in temperature and dehydration he became irrational and very restless. Toward the end he became almost maniacal, requiring restraint and narcotics. Dextrose intravenously, 100 cc. of a 50 per cent solution, was given twice daily, and 1,000 cc. of Ringer's solution by hypodermoclysis helped only partially. Morphine, one-fourth grain (16 mg.), with or without atropine, one-one hundred and fiftieth grain (0.4 mg.), gave most relief and was administered every three to six hours. The oxygen tent seemed only to increase the restlessness.

An electrocardiogram (fig. 2 *A*) taken ten hours after the onset showed a heart rate of 76 per minute, with sinus rhythm. The QRS wave in lead 1 was almost iso-electric, showing only a slight notching, with a high ST. Axis deviation was plus 55 degrees.

The electrocardiogram taken on the 26th (fig. 2 *B*) showed a rate of 120. The QRS in lead 1 was wider. The ST wave taken was higher, but the T wave was upright. QRS in leads 2 and 3 was slurred, and T_3 was now inverted. Neither showed the typical changes of coronary thrombosis; both showed signs of a badly damaged myocardium.

Partial autopsy fifteen hours after death and after embalming showed a heart of normal size. There was an area of fibrinous exudate on the posterior surface of the heart and a hemorrhagic discoloration of the posterior pericardial sac but no increase of pericardial fluid. The whole left ventricle was dark and soft. Sections showed the ventricular muscle to be hemorrhagic and flabby, and in places near the apex questionable abscess formation. The surface arteries were bluish streaked and on section were hard and cartilaginous throughout. The larger portions were irregular and felt calcareous. About 1 cm. from the origin of the left coronary artery was a thrombus which appeared hemorrhagic on the surface and which was demonstrated on section. A cross section (fig. 3) prepared by Dr. J. O. Collins of the Waterbury Hospital showed the advanced sclerosis of the artery, signs of arteritis in some areas, and a part of the clot which caused the occlusion.

Reports of coronary thrombosis in its various aspects are frequent, but a survey of the literature has failed to disclose any case with such a degree of hyperpyrexia.

103 North Main Street.

GALVANIC BURNS OF THE TONGUE

LESTER HOLLANDER, M.D.; LEO SHONFIELD, D.D.S., PITTSBURGH, AND ABRAHAM FISHER, M.D., McKEESPORT, PA.

That galvanic currents generated by dissimilar metals used for the purpose of dental fillings, crowns and bridgework may cause lesions of the mucous membrane of the oral cavity has been noted previously by Fitzwilliams,[1] Lain [2] and Hollander.[3] The following report adds another clear-cut demonstration of that contention:

REPORT OF CASE

History.—G. R., a married man, aged 40, white, an electric welder, referred to the Pittsburgh Skin and Cancer Foundation, July 2, 1932, by Dr. P. J. Zeedick, presented six faceted lesions

Fig. 1.—Clinical appearance of the lesions.

on the margin and tip of the anterior third of the tongue. Although this entire area of the tongue was swollen and reddened, each lesion was distinct and separate and conformed in shape to the lingual surfaces of the upper anterior teeth. The center of each of these six lesions was depressed, and the borders were raised above the surrounding inflamed mucous membrane covering of the tongue. The lesions themselves were covered entirely by a white discoloration, which felt thick and rough and was so firmly attached that it could not be removed. This portion of the tongue rested against certain dental restorations, which consisted of three crowns and a small fixed bridge.

Fig. 2.—Gold crowns and bridgework.

The upper right lateral, the upper right cuspid, and the upper right first biscuspid were crowned with hollow metal two piece 22 carat gold. The upper left lateral incisor had a hollow metal two piece 22 carat gold crown to which the upper left central incisor, in the form of a porcelain pin facing, was soldered. This bridge had also a lingual rest extending into the gingival third of the natural left central incisor. The porcelain pin facing and the lingual rest were backed with 24 carat gold and soldered to the gold crown with 18 (?) carat gold solder.

From the Pittsburgh Skin and Cancer Foundation.

1. Fitzwilliams, D. C. L.: The Tongue and Its Diseases, New York, Oxford University Press, 1927, p. 150.
2. Lain, E. S.: Chemical and Electrolytic Lesions of the Mouth Caused by Artificial Dentures, Arch. Dermat. & Syph. **25**: 21-31 (Jan.) 1932.
3. Hollander, Lester: Galvanic Burns of the Oral Mucosa, J. A. M. A. **99**: 383-384 (July 30) 1932.

There were no other dental restorations in his mouth. The crowns had been inserted sixteen months before and the bridgework twelve months before. Shortly after the bridge was installed, the lesions described made their first appearance on the tongue and had since grown progressively worse.

The patient complained of a metallic taste, a burning, and a sensation of thickness of the tongue. Smoking, chewing of tobacco or anything that caused an increased flow of saliva aggravated the subjective symptoms.

Fig. 3.—Histologic structure of one of the lesions. The marked acanthosis and lymphatic cell infiltration of the corium may be noted.

A clinical diagnosis of leukoplakia linguae and chronic glossitis was made.

Course of the Disease and Treatment.—July 7, 1932, the largest lesion was removed for microscopic study. July 13, all restorations were removed. July 15, the tongue showed a marked improvement; the lesions became flatter and most of the inflammation and all the subjective symptoms disappeared. On account of the presence of periapical infection, the upper right lateral, the upper right cuspid and the upper right first bicuspid were extracted. By July 21, the lesions had disappeared entirely.

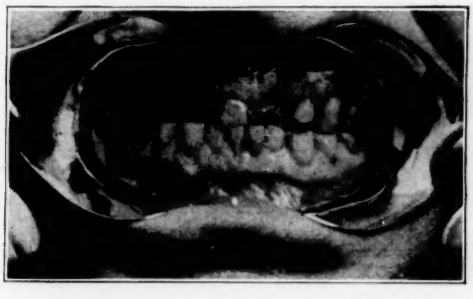


Fig. 4.—Mouth after dental restorations and infected teeth had been removed.

The histologic structure showed changes both in the superficial and in the deeper layers of the lingual mucosa. This consisted of a hyperkeratosis, an intense acanthosis with widening and deep proliferation of the interpapillary pegs, and a marked lymphocytic infiltration of the papillary layer. The blood vessels appeared dilated. Thus the histologic structure confirmed the clinical diagnosis of leukoplakia and chronic inflammation of the tongue.

In order that the possibility of a hypersensitivity of the patient to gold could be excluded, a patch test was carried out, leaving the removed gold in apposition with the skin for a period of one week. This procedure caused no perceptible reaction.

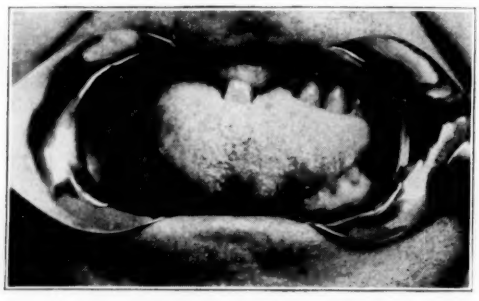


Fig. 5.—Healed condition of the tongue.

COMMENT

The history, clinical appearance before and after the removal of the crowns and bridgework, and photomicrographs of one of the lesions are submitted to substantiate further the contention that galvanic burns cause pathologic lesions in the oral mucosa.

631 Jenkins Building, Pittsburgh—536½ Fifth Avenue, McKeesport.

TORULA MENINGO-ENCEPHALITIS

JAMES B. ROGERS, M.D., AND FRANKLIN JELSMA, M.D.
LOUISVILLE, KY.

This case of torula meningo-encephalitis is reported as a matter of record and to call attention to the recognition of this condition, rather than because of some unusual feature of the case. The clinical course is fairly representative of torula infection of the central nervous system.

The literature up to 1929 has been reviewed thoroughly by Stone and Sturdivant.[1] The differential points between torula

Fig. 1.—Section through leptomeninges and cortex in area of infection, showing a portion of an artery with Torula histolytica present in large numbers in the pia. Reduced from a photomicrograph with a magnification of 990 diameters.

infection, oidiomycosis and coccidioidal granuloma were considered in detail by Stoddard and Cutler.[2]

REPORT OF CASE

G. G., aged 47, a telegrapher, first observed Feb. 10, 1930, was found lying unconscious on the floor by his wife, three weeks previously, just before the usual time to depart for work. Prior to this time his health had been good. After a short time he regained consciousness. There was a total amnesia for events immediately preceding the unconscious state. The patient remained in bed for three weeks at home, during which time he complained of severe headache, a defective memory and occasional vomiting. He seemed entirely unconcerned about his condition. His vision became decidedly impaired. Three other unconscious spells occurred, each lasting from two to three minutes, and all free from convulsive manifestations. At times dizziness and incoordination became so pronounced that he dared not walk.

The past history was irrelevant.

On neurologic examination the patient appeared quite euphoric and uncooperative. The sense of smell was diminished bilaterally. There were 5 diopters, choking of both disks and numerous hemorrhages in the right fundus. Visual fields could not be determined because of lack of cooperation of the patient. The left seventh nerve showed a supranuclear paralysis. Marked mental deterioration, memory changes and euphoria were present. No aphasic symptoms or sensory changes could be demonstrated. There was a spasticity and weakness of the left extremities.

Dizziness, incoordination and a tendency to fall to the left were present. The Romberg sign was positive. Adiadokokinesia was marked in the right upper extremity. There was a coarse, well sustained nystagmus of both eyes.

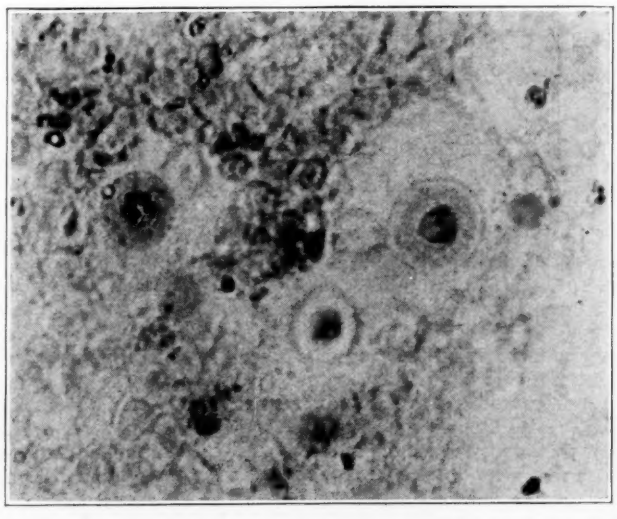


Fig. 2.—Section through leptomeninges, showing Torula histolytica in large numbers. Reduced from a photomicrograph with a magnification of 1,375 diameters.

Abdominal and cremasteric reflexes were absent on the left. The Babinski, Gorden and Oppenheim reflexes were not present. The blood and urine observations were normal. Spinal fluid and blood Wassermann reactions were negative.

A tentative diagnosis was made of a right frontal lobe lesion, and the patient was removed to the hospital, February 11, for diagnostic study and treatment. He continued to complain of severe right frontal pain. His general condition remained about the same. Because of the possibility of an intracerebral hemorrhage and the atypical history of neoplasm, a burr hole was placed in the postfrontal area and the brain explored with a needle. At a depth of approximately 3 cm., definite resistance was encountered. At a depth of approximately 4 cm. a dark brown fluid escaped from the needle. About 12 cc. of the fluid was drained, which did not yield organisms on culture. Primary smears were reported negative for organisms. Examination of the fluid showed large amounts of bilirubin and biliverdin. It was considered typical of laked blood. The anterior horn of the ventricle was punctured; the ventricular fluid was replaced with air and stereoroentgenograms were taken.

Ventriculograms showed ventricles of normal contour and location. The day after the operation, the headache subsided. Improvement continued and the patient left the hospital,

From the Departments of Anatomy and Surgery, University of Louisville School of Medicine.

1. Stone, W. J., and Sturdivant, B. F.: Meningo-Encephalitis Due to Torula Histolytica, Arch. Int. Med. **44**: 560-575 (Oct.) 1929.
2. Stoddard, J. L., and Cutler, E. C.: Torula Infection in Man, Monograph 6, Rockefeller Institute of Medical Research, 1916.

February 22. About three weeks later he was able to return to work.

There were no further disturbances until almost two years later (Feb. 7, 1932). The patient had gone to work as usual, feeling well. About midnight, a severe right frontal headache and vomiting incapacitated him. He was removed to the hospital, February 9. The physical examination at this time revealed a good pulse of 80 per minute. The blood pressure was 120 systolic, 80 diastolic. The temperature was 98.8 and respirations were 20. He was dehydrated. There was a definite weakness of both left extremities. The lungs, heart and abdomen were essentially normal. Neurologic examination showed 1 diopter of swelling of both disks, a supranuclear type of paralysis of the left seventh nerve, weakness of the left extremities with hyperactive deep reflexes, and a positive Kernig sign.

There was 250 mm. of spinal fluid pressure. The fluid was clear, yet a microscopic examination revealed 127 erythrocytes per cubic millimeter, 51 leukocytes and 210 yeast cells. The total protein was 45 mg. per hundred cubic centimeters. Globulin and colloidal gold and Wassermann tests were negative. The urine and blood were normal. Roentgenograms of the chest were essentially negative.

At the hospital, the patient complained bitterly of a right frontal headache. The temperature was 99.4. The pulse was 80 and respirations were 20. February 10, the patient had a convulsion, which began on the left side and became generalized. He remained unconscious for twenty-five minutes. February 11, 50 cc. of ventricular fluid was withdrawn and replaced with 20 cc. of air. These ventriculograms showed the lateral ventricles to be of normal position and contour, except for an irregular collection of air in the right parietal lobe that seemed to connect with the right ventricle. This was interpreted as a small cyst that had ruptured into the ventricle.

The patient was treated symptomatically. Various anodynes and hypnotics were used. Sodium iodide, 10 cc. of a 10 per cent solution, was given intravenously on three successive days. Spinal puncture would relieve the headaches to some extent, but the patient's condition continued to grow worse. February 14, about 2 ounces (60 cc.) of dark sanguineous fluid was drained by needle from the parietal region. A section was taken for study, including leptomeninges and cortex. Convulsions increased; the patient became irrational and died, February 21. A necropsy was refused.

The microscopic sections of tissue specimen showed a proliferation of connective tissue cells in the pia, a few lymphocytes and numerous torulae. The protoplasm of the organisms stained pink with eosin and contained a mass of irregular dark granules. Budding forms were common. The torulae varied from 2 to 12 microns in diameter. Many were surrounded by a clear zone. There were no polymorphonuclear leukocytes in the tissue.

COMMENT

In this case, marked temperature increase was never a prominent symptom, and during the first two years of infection the condition remained localized, only once giving symptoms of a focal nature. These symptoms were due apparently to an accumulation of fluid in the postfrontal region. When the fluid was removed, the symptoms promptly disappeared. Two years elapsed before progress of the infection was sufficient to give further symptoms, which, at this time, appeared as meningeal as well as focal cerebral symptoms. The infection had slowly progressed and invaded the meninges when the organism was found in the spinal fluid.

The World Beyond the Unaided Eye.—Leeuwenhoek was not without honor during his lifetime. Scientists and nobility came to Delft to see this man of the microscopic world. Peter the Great of Russia, Queen Mary of William and Mary, Frederick I of Prussia, and others stopped in Delft to call on Leeuwenhoek. Like the public of today, these rulers of the seventeenth century were impressed with the scientific developments of their day. They were curious to know what lies in the world beyond the unaided eye of man. . . . Leeuwenhoek made many microscopes; the exact number is not known, although he left 247 not only with lenses but usually with objects in place. He also left 172 plates with one lens in each, or a total of 419 lenses.—Fred, E. B.: Antony Van Leeuwenhoek on the Three-Hundredth Anniversary of His Birth, *J. Bacteriol.* **25**:1 (Jan.) 1933.

Council on Pharmacy and Chemistry

PRELIMINARY REPORTS OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING PRELIMINARY REPORT. PAUL NICHOLAS LEECH, Secretary.

DILAUDID

In the past few months a new narcotic drug, dihydromorphinone hydrochloride, has been introduced for clinical use in this country under the proprietary name "Dilaudid." It is marketed by Bilhuber-Knoll Corp., Jersey City. The drug has been used in Europe for some years, having been patented in 1923. The first paper on its pharmacologic action appeared in 1926 together with a clinical report by Krehl. Since that time numerous articles on its action have been published; at the present time the bibliography of the product numbers some two hundred titles.

Briefly stated, the drug is closely allied both chemically and pharmacologically to morphine, having the analgesic property of morphine as well as its action on the respiratory system. Its action on the intestine is probably less marked than is that of morphine. It is more toxic than morphine and is clinically effective in doses which are considerably smaller than are necessary with that alkaloid.

A most important point to be considered in connection with its use, however, is whether or not its administration is followed by a condition of euphoria which might lead to addiction such as is so common with morphine. It is largely in connection with the latter property that the superiority of Dilaudid over morphine is being urged; it becomes therefore a matter of great importance to ascertain whether this claim to superiority is merited.

The drug was brought to the attention of American clinicians largely by a statement by Alvarez of the Mayo Clinic, published in the *Proceedings of the Staff Meetings* in August, 1932. In discussing the euphoric action of Dilaudid, Alvarez stated that so far as he knew no one had as yet become habituated to its use. Unfortunately, this statement was unwarranted because already at that time a number of cases of addiction to Dilaudid had been reported in the literature. More than once warnings had been issued calling attention to the possibility of addiction and to the need of caution until more was known of the possible dangers of the drug.

Shortly after Alvarez's remarks were made at the staff meeting, a similar statement appeared in the Associated Press news from "Science Service." This resulted in wide publicity, as it was copied more or less accurately by the press of the country. A few of these statements follow:

From *Collier's*, Dec. 10, 1932. "Keeping Up with the World," by Freling Foster:

"A new drug, five times as potent as morphine, has recently been brought to America from Germany. It is particularly useful in the last stages of cancer because it virtually relieves all pain and permits the patient to be up and working."

From the *Literary Digest*, Dec. 17, 1932:

"Five Times as Powerful as Morphin, but Harmless."

"A NEW pain-relieving drug which is about five times as potent as morphin, without the latter's habit-forming quality, was described by Dr. Walter C. Alvarez of the Mayo Clinic at Rochester, Minnesota, recently.

"To quote a mail report of Science Service (Washington):

'The new drug is Di-hydro-morphinone hydrochlorid. It was developed in Germany in 1926 by the Knoll laboratories, but it is only now being brought to the attention of physicians in this country. It is particularly useful for cases of cancer that cannot be operated on. It gives more relief from pain than morphin and prolongs the useful life of the patient, who can be up and working while taking this drug. Of course, it is not a "cure", but it does help the patient by relieving the pain and other symptoms of the last stages of the disease. Dr. Alvarez also suggested that it might be used in treating morphin addiction. "Occasionally it may be helpful in the treatment of morphinism through its power to relieve distress while the patient is getting a grip on himself," he said.

'The drug does not seem to be dangerous, does not produce the pleasurable sensations of morphin and, consequently, is not habit-forming. In a few persons it has some of morphin's nauseating effect, but to compensate for this it has none of the troublesome effect on the intestines. The new analgesic is made from morphin hydrochlorid with the help of a catalytic agent which causes it to combine with water'."

From the *Montgomery* (Ala.) *Advertiser,* Dec. 18, 1932:

"AN IMPORTANT NEW DRUG"

"Di-hydro-morphinone-hydrochlorid.

"That's it. The Mayo Clinic at Rochester developed it, the word and the drug, for it means a drug, a pain relieving drug, five times as potent as morphine, as harmless as water and with no habit forming qualities.

"The medical journals say it is particularly useful in the operation of cases where other drugs seem to offer no relief from pain. Unlike morphine, there are no pleasurable sensations to its use, however, and if the doctors reckon correctly its use may go far toward curing addicts of the morphine habit."

As a result of this wide publicity, many inquiries were received by the Association and by the Council. These came not only from physicians but also from laymen. Persons who were suffering from pain but feared to take morphine were especially interested, as now they were promised a drug which was reputed to be "harmless as water"; and even in cases of advanced cancer it was said that it would prolong their lives and permit them to return to work once more.

Realizing the importance of furnishing accurate information in this case both to the profession and to the laity, the Council asked Dr. Nathan B. Eddy of the Department of Pharmacology of the University of Michigan to make a report to the Council on the general status of the alkaloid. It seemed especially fitting that Dr. Eddy should be asked to report on this question because, as is well known, Dr. Eddy is engaged on a study of the action of possible substitutes for morphine under funds supplied by the Rochefeller Foundation to the Drug Addiction Committee of the National Research Council.

Dr. Eddy's report on the literature and on the results of his experiments with Dilaudid appears below. The report has been reviewed by the Council and is published with its approval and with its thanks to Dr. Eddy for the preparation of the report.

The Council has postponed for a reasonable length of time the consideration of Dilaudid with the view of determining its eligibility for inclusion in New and Nonofficial Remedies in order to give the manufacturer opportunity to submit it and to revise the advertising in conformity with the available evidence.

DILAUDID (DIHYDROMORPHINONE HYDROCHLORIDE)

NATHAN B. EDDY
ANN ARBOR, MICH.

Dilaudid (di-hydromorphinone hydrochloride) was first described in the German patent literature of 1923,[1] and after a very brief pharmacologic study [2] was given to a number of clinics for trial, the first report of its use appearing in 1926.[3] Since then, the German clinical literature has contained many references to it, and recently two papers on the subject have appeared in English journals, so that at the present writing a complete bibliography would number nearly 200 titles. As reported in the *Lancet,*[4] the Committee of Experts, appointed in May, 1931, by the Council of the League of Nations to consider the advantages and disadvantages of heroin (diacetylmorphine) and the possibility of substituting some other substance for it, briefly summarized the situation in regard to dilaudid as follows: "For the relief of pain in patients in whom it is undesirable to act on the bowels, heroin is better than morphine but dilaudid offers the same advantages. Dilaudid has a slightly weaker effect on the respiratory center than heroin; it has the same analgesic effect as heroin; both drugs have little effect on the alimentary canal. The euphoric effects of dilaudid are weaker than both morphine and heroin as gaged by withdrawal symptoms."

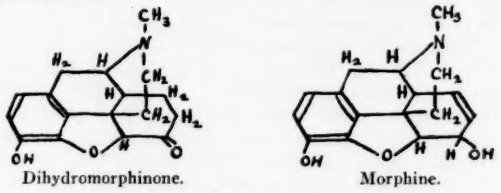
Chemically, dilaudid is dihydromorphinone hydrochloride. Its relationship to morphine is shown by their structural formulas. It differs from morphine in two respects: replacement of one of the hydroxyls by a ketonic oxygen, and removal of an adjacent double bond by hydrogenation. The substance is prepared by hydrogenation of morphine in warm strongly acid solution in the presence of a large excess of palladium or platinum catalyst. It is a white crystalline powder readily soluble in water; it contains 88.7 per cent of alkaloidal base.

From the Laboratory of Pharmacology of the University of Michigan Medical School.

1. Knoll and Co.: D. R.—p. 365683; Jahresber. chem. Tech. **49,** II, 1923: D. R.—p. 380919; Jahresber. chem. Tech. **49,** II, 122, 1923.
2. Gottlieb, R.: München. med. Wchnschr. **73:** 595 (April 9) 1926.
3. Krehl, L.: München. med. Wchnschr. **73:** 596 (April 9) 1926.
4. Report of League of Nations Committee of Experts: Lancet **2:** 55 (July 4) 1931.

REVIEW OF CLINICAL EXPERIENCE

Dilaudid has been used by all the usual modes of administration—oral, rectal, subcutaneous and intravenous—and by all the routes the most commonly employed dosage has been from 2 to 2.5 mg. Some authors have found larger doses necessary, and a few have reported results with less. Nearly all of them, however, have commented on the early development of effects, stating that relief of pain, for example, was accomplished within from ten to fifteen minutes, whatever the mode of administration.



Dihydromorphinone. Morphine.

Structural formulas.

Reported dosages have ranged from 1 to 7.5 mg. for a single administration, with 25 mg. as the maximum for twenty-four hours. Freundlich [5] gave 5 mg. as the usual preanesthetic dose, while Dittrich [6] found 2.5 mg. satisfactory for the same purpose. Lullies,[7] reporting the use of dilaudid in more than 1,000 surgical cases, said that 2 mg. was usually not sufficient but that 3 or 4 mg. was given subcutaneously or from 2.5 to 5 mg. by rectum. Simenauer and Pulfer [8] also reported that from 2 to 3 mg. had a negligible analgesic action; that 4 mg. decreased and abolished pain, but that two doses of 4 mg. was the highest daily dosage they had used. Grage,[9] on the other hand, used 2 mg. orally or 2.5 mg. subcutaneously in tabetic crises and said that 1 mg. was sometimes sufficient.

Krehl,[3] Paulsen,[10] Schwarz,[11] Crohn,[12] Klemperer,[13] Markowicz,[14] Paeprer [15] and others reported favorably on the use of dilaudid in the treatment of cough, especially in tuberculosis. They gave from 1.25 to 7.5 mg. and repeated the larger doses three times or the smallest amount as often as ten times a day.

Some clinicians have attempted to evaluate dilaudid by determining its dosage and that of morphine which gave equivalent results, as shown in the accompanying table. In addition, Bescht [16] said that the effect of dilaudid on the central nervous system of man was the same as that of morphine but

Equivalent Doses of Dilaudid and Morphine

Author	Dilaudid, Mg.	Morphine, Mg.	Reason for Administration
Basch [40]	2	10	Pain
Hemmerling [18]	5	10–20	All purposes for which morphine would have been given
Krüskemper [23]	5	10–20	Pain
von Werthern [19]	5	10–20	All purposes for which morphine would have been given
Birkholz [39]	2	10	Preliminary to anesthesia
Loewenthal [26]	2–2.5	10	Cough
von Oettingen: München. med. Wchnschr. **74:** 1184 (July 15) 1927...	2	10	Preliminary to anesthesia
von Hoesslin [27]	2	20	All purposes for which morphine would have been given
Simenauer and Pulfer [8]	4	10	Preliminary to anesthesia

5. Freundlich, E.: Fortschr. d. Med. **45:** 137 (Aug. 5) 1927.
6. Dittrich, Alfred: München. med. Wchnschr. **73:** 863 (May 21) 1926.
7. Lullies, Gertrud: München. med. Wchnschr. **76:** 1463 (Aug. 30) 1929.
8. Simenauer, Erich, and Pulfer, Hans: Deutsche med. Wchnschr. **55:** 147 (Jan. 25) 1929.
9. Grage: Deutsche med. Wchnschr. **53:** 1979 (Nov. 18) 1927.
10. Paulsen, Ernst: Deutsche med. Wchnschr. **53:** 1516 (Sept. 2) 1927.
11. Schwarz, Alexander: Zentralbl. f. inn. Med. **49:** 173 (Feb. 25) 1928.
12. Crohn, W. H.: Med. Klin. **25:** 477 (March 22) 1929.
13. Klemperer, Felix: Therap. d. Gegenw. **70:** 331, 1929.
14. Markowicz, Walter: Schweiz. med. Wchnschr. **59:** 438 (April 20) 1929.
15. Paeprer, T.: Therap. d. Gegenw. **70:** 330, 1929.
16. Bescht, Erich: Med. Klin. **23:** 1582 (Oct. 14) 1927.

that the effective dose was only from one third to one fourth as great; and according to Schwarz,[11] dilaudid fully replaced morphine in tuberculosis in one-tenth to one-fifth the dosage.

All of these comparisons were of the effect of the administration of single doses. In reference to the repeated use of dilaudid, the absence of tolerance has been reported frequently. In most cases, however, the author has said simply that in his experience he had not seen any evidence of tolerance or any necessity for increasing the dose and has not given details of the dosage, the duration of administration or other pertinent data of cases in which he believed tolerance had not occurred. There are a few partial exceptions to this general statement.

Fürst[17] reported a case in which 5 or 10 mg. was given daily for four months. Hemmerling[18] gave a patient with sciatica 5 mg. of dilaudid every other night and obtained analgesia of eleven hours' duration. At the end of four weeks the analgesia lasted from nine to ten hours. In another case, reported by the same author, after tolerance to morphine had been established, 7.5 mg. of dilaudid gave ten hours sleep. At the end of six weeks the ten hours sleep was still obtained with the same dosage. However, that such an observation as the last mentioned establishes absence of tolerance is exceedingly doubtful. In a third case, one of cardiac decompensation, Hemmerling substituted 5 mg. of dilaudid for 10 mg. of morphine and said that that dosage continued effective during a period of four weeks. Von Werthern[19] said that he had seen no occasion to increase the dose of dilaudid in repeated administration but was not willing to commit himself on the question of tolerance because his experience had been too brief. Von Hilger[20] reported that he had given for relief of pain eighteen 2.5 mg. tablets weekly for a year without increasing the dose. Bescht[16] stated that there was no tolerance established with small doses, from 2 to 2.5 mg., in several weeks (periods of twenty-four, thirty-one and thirty-seven days are mentioned) but that he had seen definite tolerance to larger, euphoric doses, 4 mg. Zahler[21] reported that analgesic action did not diminish much during periods for which dilaudid was commonly employed and that there was no necessity for increasing the dosage. He cited a case in which the same dose continued to be used during six months for the relief of pain, though the quieting effect of the drug disappeared within three weeks. He said also that the respiratory center did not show habituation. In a later paper, Zahler[22] described in general terms without details the changes in the blood sugar and blood calcium after single and repeated doses of morphine and dilaudid. The latter produced the same type of changes as the former, though the rates at which the changes were established were different. Crohn,[12] Klemperer[13] and Paeprer[15] each referred to the necessity of increasing dosage in persistently chronic and severely painful conditions.

In connection with these direct statements in regard to tolerance to dilaudid, there should be taken into account specific observations on the effective dosage of the drug in the presence of morphine tolerance. For example, Fürst[17] reported an effective daily dose of from 5 to 10 mg. after tolerance to from 10 to 20 mg. of morphine had developed. Hemmerling[18] said that 7.5 mg. gave ten hours' sleep to a cardiac patient to whom after many weeks' use 20 mg. of morphine gave only four or five hours' sleep. Krüskemper[23] described a patient, who, after receiving 70 mg. of morphine four times a day, was relieved by 10 mg. of dilaudid four times a day. Trautmann[24] reported that, after the development of morphine tolerance, 60 mg. of morphine or 10 mg. of dilaudid gave relief from pain for only two or three hours. Von Werthern,[19] stating that 2 mg. was the usual analgesic dose of dilaudid, gave 5 or 6 mg. when 20 mg. of morphine was required or when an individual was tolerant to 20 mg. of morphine. Hartung,[25] who used 2 mg. subcutaneously in painful conditions, found that 4 mg. was required for patients who had been taking other narcotics of this class. Loewenthal[26] gave from 6 to 8 mg. to a patient who was tolerant to 80 mg. of morphine and continued this dose for a month without further increase. Paulsen[10] found that 2 mg. of dilaudid three times a day controlled pain, cough and restlessness for many weeks after a tolerance had been established to 30 mg. of morphine. Von Hoesslin[27] reported that, in the presence of tolerance, 4 mg. of dilaudid and 40 mg. of morphine, in one case, and 6 mg. of dilaudid and 100 mg. of morphine, in another case, gave the same results. Possibly of especial significance is the statement of Grage[9] that he used dilaudid satisfactorily during the slow withdrawal of morphine. He did not record the dosage employed. It will be noted that some of these references are to authors who denied that dilaudid produced tolerance.

While the statements quoted tend to show that tolerance to small doses of dilaudid develops slowly, if at all, there is no doubt that cross tolerance has been demonstrated; the ratio of effective single doses was approximately the same whether or not tolerance to morphine had developed. It is seriously questioned whether in the long run dilaudid and morphine will be found to differ in their tolerance inducing properties.

Tolerance and addiction are intimately associated in the use of morphine, but the two are not necessarily concomitant, and observations that permit a conclusion in regard to the one do not of themselves imply the same conclusion in regard to the other. The authors reporting on the use of dilaudid have had relatively little to say about the danger of addiction. Most of them at the time of their report had had but a few months' to a year's experience in its use. A few commented on the presence or absence of euphoria, a symptom or condition which, if produced by the drug, would favor development of addiction:

Bescht:[16] There was no euphoria with from 2 to 2.5 mg., but it did occur after 4 mg. Grage:[9] The euphoria was different from that of morphine and in his opinion was dependent on the relief of pain. Zahler:[21] Usually there was no euphoria with doses sufficient to relieve pain, but a dose of 5 mg. was strongly narcotic and euphoric. Bender,[28] Markowicz,[14] Simenauer and Pulfer:[8] Dilaudid did not produce euphoria. Lullies:[7] In fresh postoperative cases the narcotic and euphoric actions of other morphine preparations failed almost entirely after dilaudid. Rödel:[29] Slight euphoria followed the administration of 2 mg. intravenously. Leyton:[30] Euphoria occurred in some cases. Alvarez:[31] Euphoria was much less marked with dilaudid than with morphine. The last statement, however, seems to be based as much on impressions from the literature as on personal experience. Alvarez said in the same sentence with the remark in regard to euphoria that so far as he could learn no one had as yet become habituated to its use. This review of the literature shows that Alvarez evidently overlooked many instances of addiction that had been reported.

Trautmann[24] reported that he had seen no craving for the drug but added that his experience was not sufficiently extensive. Behlau[32] in 1927 said: "We must still think that in spite of the relative nontoxicity of dilaudid we have to do with a morphine preparation." Grage[9] maintained that tolerance and addiction to dilaudid could occur. He cited two cases and remarked that the addiction was not as severe as after morphine and was more easily cured. Müller de la Fuenta[33] reported a case of addiction of a year's duration. The dose had been increased from six or eight to fifteen or eighteen 2 mg. ampules a day. Wolff,[34] in 1928, received 280 replies to questionnaires concerning addiction, in eight of which addiction to dilaudid was reported. In a later discussion of these replies Wolff[35] said that the report of addiction by eight observers was of special importance because at the time dilaudid was but little used. He added that the pharmacologic similarity of dilaudid to morphine made addiction to it readily understandable and that indeed it possessed a high degree of addiction property. In another place, Wolff[36] also mentioned

17. Fürst, Kurt: Med. Klin. **22**: 1306 (Aug. 20) 1926.
18. Hemmerling, H.: München. med. Wchnschr. **73**: 597 (April 9) 1926.
19. von Werthern: Med. Klin. **22**: 1229 (Aug. 6) 1926.
20. von Hilger, A.: Fortschr. d. Med. **45**: 215 (Aug. 26) 1927.
21. Zahler, Heinrich: Deutsche med. Wchnschr. **54**: 1596 (Sept. 21) 1928.
22. Zahler, Heinrich: Deutsche med. Wchnschr. **56**: 522 (March 28) 1930.
23. Krüskemper, C.: Klin. Wchnschr. **5**: 1397 (July 23) 1926.
24. Trautmann, Edgar: München. med. Wchnschr. **73**: 1747 (Oct. 15) 1926.
25. Hartung, Curt: München. med. Wchnschr. **74**: 282 (Feb. 18) 1927.
26. Loewenthal, M.: Therap. d. Gegenw. **68**: 429 (Sept.) 1927.
27. von Hoesslin, H.: Klin. Wchnschr. **9**: 1382 (July 19) 1930.
28. Bender: Psychiat.-neurol.. Wchnschr. **31**: 261 (May 25) 1929.
29. Rödel, Walther: Therap. d. Gegenw. **71**: 238, 1930.
30. Leyton, O.: Lancet **1**: 835 (April 16) 1932.
31. Alvarez, W. C.: Proc. Staff Meet., Mayo Clin. **7**: 480 (Aug. 17) 1932.
32. Behlau, C.: München. med. Wchnschr. **74**: 1131 (July 8) 1927.
33. Müller de la Fuenta: Med. Klin. **23**: 519 (April 8) 1927.
34. Wolff, Paul: Deutsche med. Wchnschr. **54**: 7 (Jan. 6) 1928.
35. Wolff, Paul: Deutsche med. Wchnschr. **54**: 224 (Feb. 10) 1928.
36. Wolff, Paul: Deutsche med. Wchnschr. **54**: 134 (Jan. 27) 1928.

the satisfactory use of dilaudid in the treatment of morphine addiction. In his lecture on drug addiction before the Eighty-Third Annual Session of the American Medical Association, delivered at New Orleans, May 9, 1932, Wolff said: "Dihydromorphinone has also proved valuable. It is often better tolerated and has the particular advantage that it depresses peristalsis less than morphine (hence its use after abdominal operations). Further, it has been shown both experimentally and clinically that it leads more slowly to habituation and addiction and its devotees are more easily cured." [37]

Zahler,[21] whose statements in regard to repeated doses have been quoted, claimed that in no case was there any difficulty in stopping the drug if dilaudid alone was taken. Paeprer [15] reported that during a year and a half no abstinence symptoms had been observed. Von Hoesslin [27] affirmed that, in regard to addiction, individuals vary with morphine and with dilaudid as well, and added, "Without doubt in many cases there is a marked tendency to addiction with dilaudid." Richtzenhain,[38] discussing the use of dilaudid and dicodid in nervous diseases, said that he had seen one case of addiction, although tolerance had never occurred, and in an appended footnote he said: "I feel it my duty to add a word of caution. Dilaudidismus and dicodidismus are both already so often observed that we should be as cautious with the injection of dilaudid and dicodid as we have been with morphine injections." Leyton [30] in 1932 was unable to state from his own experience whether or not addiction would be produced.

Practically every clinical paper reporting the use of dilaudid makes some reference to its side actions in comparison with those of morphine. Many [39] have said that no side actions at all were observed, while others [40] admitted the infrequent occurrence of nausea, vomiting, dizziness and headache. Nearly all are agreed that nausea and vomiting are of much less common occurrence after dilaudid than after morphine. In a few cases it has been reported [41] that a patient who had previously vomited after morphine did not vomit after dilaudid. Alvarez [31] stated: "Our impression is that nausea is produced more commonly with dilaudid than with morphine, but as yet we have not enough experience to be sure of this." At the time this statement was made the experience of the Mayo Clinic in this regard was of six months' duration.

All observers who mention the matter at all agree that dilaudid showed less tendency to produce constipation than did morphine. Kaiser [42] reported that dilaudid as well as morphine increased the contraction of the vesical sphincter leading to cramp of the bladder, the resulting tenesmus requiring the use of the catheter.

A few papers [43] have commented specifically on the respiratory effects of dilaudid and especially on the danger of respiratory paralysis. Krehl,[8] Hemmerling [18] and Trautmann [24] reported that in exceptional cases 5 mg. had slowed respiration to such an extent that respiratory stimulants were administered. Winternitz [43] said that dilaudid was somewhat more actively depressant than morphine to the respiratory center in man. Taterka and Pinéas,[43] on the other hand, considered that there was less danger of respiratory paralysis in tabetic crises with dilaudid than with morphine, and Zahler [21] thought that the effect on respiration with large doses would militate against the abuse of dilaudid.

REVIEW OF EXPERIMENTAL WORK

The experimental basis for the rather extensive clinical trial of dilaudid, which I have endeavored to review briefly, was very meager. In his report of the first experiments with the substance, Gottlieb [2] said that in frogs from 0.5 to 1.0 mg. caused cerebral narcosis followed by tetanic convulsions; that in dogs 4 mg. produced narcosis and analgesia, and that in rabbits from 0.2 to 0.3 mg. per kilogram reduced the respiratory minute volume to one half. He concluded that, as regards analgesia, respiration and narcosis in dogs, dilaudid was similar to morphine except that only one-half to one-fourth the dose by weight of dilaudid was needed. From experiments on rabbits, he concluded that the respiratory mechanism became tolerant to morphine but not to dilaudid. He gave daily injections of 1 mg of morphine per kilogram to each of two rabbits and 0.3 mg. of dilaudid per kilogram to each of four others. About once a week the respiratory rate of the rabbits was studied. The animal was kept quiet in a small box for an hour or more. Then the respiratory rate was followed for about twenty minutes. The drug was injected subcutaneously and the respiratory rate followed for an hour. The animals receiving morphine were observed for twenty-nine days. On the first day the respiratory rate decreased from 39 to 30 and on the twenty-ninth day it increased from 43 to 53. Concerning the latter, the author said that the variation might lie within the limits of error of the method. If that was so, the initial decrease might also lie within the limits of error. Furthermore, I have shown [44] that the minimal effective dose of morphine to produce consistent decrease in respiratory rate in rabbits is 2 mg. per kilogram, and van Dongen [45] demonstrated in 1915 his inability to obtain habituation to morphine of the respiratory mechanism of the rabbit. With dilaudid, Gottlieb obtained a 25 to 30 per cent decrease in respiratory rate at each observation throughout the experiment. These results support the contention that tolerance to dilaudid does not occur but they do not prove that tolerance to morphine did occur.

Joël and Ettinger [46] reported that in rats the intoxication picture of dilaudid was practically identical with that of morphine. Two milligrams of the former per hundred grams caused a two to four hour narcosis followed by an excitation stage. In animals in which a tolerance to morphine had been developed, 2 mg. of dilaudid per hundred grams caused only the excitation. The authors concluded that a tolerance to dilaudid to the extent of a disappearance of the narcotic stage could be developed in rats.

Nau [47] performed a few comparative experiments on tadpoles, frogs, toads and fishes with dilaudid, morphine and heroin. All three paralyzed the central nervous system and were convulsant relatively in about the same degree as they were narcotic. All three paralyzed the frog's skeletal muscle and the toad's heart. In this respect dilaudid was twice and heroin was eight times as powerful as morphine.

Seeliger [39] injected morphine or dilaudid subcutaneously in rabbits with an abdominal window in order to observe their effect on peristalsis. Sufficient analgesia was produced by dilaudid to permit him to perform the operation for the insertion of the window without the use of another anesthetic. Peristalsis reappeared after morphine in from fourteen to sixteen hours, and after dilaudid in six hours. Unfortunately, the author did not state the doses used.

Schoen [48] injected dilaudid intravenously in rabbits in doses of from 0.5 to 50 mg. per kilogram. One milligram per kilogram slowed the respiration, abolished the response to pain and abolished postural reflexes. General muscular tone was increased. Fifty milligrams per kilogram caused periods of extreme depression followed by periods of marked irritability. Two milligrams per kilogram subcutaneously had the effect of 1 mg. intravenously.

Schmitt [49] gave dilaudid subcutaneously two or three times at intervals of seven days to each of twenty-two dogs. Five milligrams per kilogram caused emesis three times in fifty experiments. It slowed the heart, decreased the temperature and decreased sensitivity but did not induce sleep. With 10 mg. per kilogram the effect was greater but its duration was not prolonged. The effect in young dogs was less prolonged than

37. Wolff, Paul: Drug Addiction—A World-Wide Problem, J. A. M. A. **98:** 2175 (June 18) 1932.
38. Richtzenhain: Therap. d. Gegenw. **71:** 431, 1930.
39. Behlau.[22] Birkholz: Deutsche med. Wchnschr. **53:** 323 (Feb. 18) 1927. Crohn.[12] Grage.[9] Hartung.[25] Von Hilger.[20] Loewenthal.[26] Paeprer.[15] Rady, Hilar: Med. Klin. **22:** 738 (May 7) 1926. Schneider, Albert: Therap. d. Gegenw. **71:** 239, 1930. Schubert, M.: Deutsche med. Wchnschr. **56:** 834 (May 16) 1930. Seeliger, P.: Wien. klin. Wchnschr. **40:** 495 (April 14) 1927.
40. Alvarez.[31] Basch: Fortschr. d. Med. **44:** 622, 1926. Bender.[28] Dielmann, Hans: Med. Klin. **22:** 1929 (Dec. 10) 1926. Ellerau: Klin. Wchnschr. **5:** 2430 (Dec. 17) 1926. Freundlich.[5] Fürst.[17] Klemperer.[13] Krehl.[8] Krüskemper.[28] Leyton.[30] Lullies.[7] Richtzenhain.[38] Schwarz.[11] Simenauer and Pulfer.[8]
41. Dielmann.[40] Loewenthal.[26]
42. Kaiser, K.: Klin. Wchnschr. **6:** 1687 (Aug. 27) 1927.
43. Krehl.[8] Hemmerling.[18] Trautmann.[24] Zahler.[21] Von Hoesslin.[27] Taterka, Hans, and Pinéas, Hermann: Nervenarzt **1:** 543 (Sept. 15) 1928. Winternitz, H.: Deutsche Med. Wchnschr. **55:** 480 (March 22) 1929.
44. Eddy, N. B.: J. Pharmacol. & Exper. Therap. **45:** 339 (July) 1932.
45. van Dongen: Arch. f. d. ges. Physiol (Pflüger's) **162:** 54, 1915.
46. Joël, Ernst, and Ettinger, Alice: Arch. f. exper. Path. u. Pharmakol. **115:** 334, 1926.
47. Nau, F. A.: Inaug.-Diss., Marburg, 1930.
48. Schoen, Rudolf: Arch. f. exper. Path. u. Pharmakol. **146:** 84, 1929.
49. Schmitt, Joseph: Arch. f. wissensch. u. prakt. Tierh. **59:** 565 (June 18) 1929.

that in older animals. An intravenous dose of 2.5 mg. had the same effect as 5 mg. subcutaneously.

Haffner[50] studied the analgesic action in mice of a large series of compounds. A clamp was placed on the tail and the extent of the pain reflex was noted. The minimal effective dose to produce complete analgesia was 0.0075 mg. of morphine per gram of body weight, 0.0037 mg. of heroin per gram, and 0.005 mg. of dilaudid per gram.

Weiss[51] described a new method for estimating analgesic action in rabbits by the prolongation, when morphine or an allied substance was injected intravenously, of the local anesthesia of the cornea produced by procaine hydrochloride. Measured in this way, the analgesic effect of from 2 to 4 mg. of dilaudid was equivalent to that of from 8 to 20 mg. of morphine.

In a more complete study than any made previously, Osman[52] investigated the action of dilaudid on frogs, guinea-pigs, rabbits and dogs. He described a typical morphine picture for its action in frogs and in dogs and rabbits. The fatal dose for the frog lay between 200 and 400 mg. per kilogram. In the dog, initial restlessness with vomiting and salivation was followed by depression, extreme muscular weakness, somnolence and analgesia, with marked slowing of the respiration. The depression was succeeded by a convulsant stage with exaggerated reflexes. The fatal dose for the guinea-pig was from 300 to 350 mg. per kilogram and for the rabbit 200 mg. per kilogram.

Osman studied in some detail the action of dilaudid on the respiration, the circulation and the central nervous system. He noted in rabbits a very marked slowing of the respiratory rate which was in part compensated for by an increase in depth, so that, with a decrease in rate to 15 per cent of the original, the minute volume was reduced to about one half. Dilaudid had little effect on the circulation, producing a slowing of the heart of central origin and only a slight fall in blood pressure. The analgesic dose for the rabbit was from 0.5 to 1 mg. per kilogram, and as a sleep producer Osman considered dilaudid superior or always at least equal to morphine.

Finally, with himself as the subject, Römmelt[53] conducted a series of psychologic studies after the subcutaneous administration of dilaudid in a dosage of 3 mg. He reported that the drug produced definite depression of mental activity, and he discussed in considerable detail the factors involved. There was no euphoria; rather a growing distaste for the injections. Nausea and vomiting occurred, but no constipating action was observed. The effect of the drug was noticeable on the day following the injection.

PRELIMINARY REPORT OF PHARMACOLOGIC STUDY

Dihydromorphinone represents a comparatively simple type of change in the morphine molecule, one of the types of change included in the program of systematic chemical and pharmacologic study which has been instituted by the Drug Addiction Committee of the National Research Council. The study of this particular substance was begun in July, 1932. In this case the product was supplied through the courtesy of the Bilhuber-Knoll Corporation to Dr. Small's laboratory, the chemical unit at the University of Virginia of the Drug Addiction Committee's organization, from which, after preliminary chemical study, it was sent to the pharmacologic unit at the University of Michigan. Our investigation of the substance is still incomplete, but it has progressed to a point at which a preliminary statement of our results can be made.[54]

Our work has included the determination of the toxicity of dilaudid for mice and young rabbits, the intramuscular administration of the substance to cats for observation of analgesic and emetic actions, the subcutaneous administration to rabbits for a study of respiratory effects, and some experiments on intestinal action in dogs and rabbits. The methods employed have been fully described elsewhere.[55]

As previously noted,[56] the toxic picture of dilaudid was very similar to that of morphine in both mice and rabbits, but the fatal dose was much smaller and the convulsant action, as represented by the relation of the minimal convulsant dose to the average fatal dose, was greater. Dilaudid was more than six times as toxic as morphine for mice and more than three and a half times as toxic as morphine for rabbits, which is a higher degree of toxicity than that reported by Osman.[52]

The minimal analgesic dose in cats of dihydromorphinone was only 0.17 mg. per kilogram, or less than one-fourth the minimal analgesic dose of morphine (0.75 mg. per kilogram) and about one-third the minimal analgesic dose of heroin (0.52 mg. per kilogram). Cats have been seen to vomit with as little as 0.1 mg. of dilaudid per kilogram and with 0.5 mg. of morphine per kilogram, while none of the animals that received heroin have vomited. In dogs, vomiting has been seen after 0.05 mg. of dilaudid per kilogram injected subcutaneously, although our dogs have rarely vomited after ten times that amount of morphine.

Dilaudid, like morphine, caused excitement in the cat, but an amount slightly greater than the minimal analgesic dose was required to bring this about. With morphine, analgesia and excitement were produced by the same dose. Possibly this difference indicates a higher degree of selective analgesic action in dilaudid.

In our experiments on rabbits, dilaudid has exerted a very powerful depressing influence on respiratory activity. One-tenth milligram per kilogram of the salt, dihydromorphinone hydrochloride, had as great an effect on respiration as 2 mg. per kilogram of morphine hydrochloride, and a greater effect than 0.1 mg. per kilogram of heroin. The respiratory rate and minute volume were decreased and the response of the mechanism to inhalation of carbon dioxide or of ammonia was less than normal. Oxygen consumption was little if at all affected by the 0.1 mg. dose of dilaudid.

Dilaudid slowed the heart of the rabbit materially. In dogs also it had a very marked effect on the heart rate, producing definite slowing when as little as 0.05 mg. per kilogram was injected subcutaneously. In both dogs and rabbits the drug had a pronounced general quieting effect.

In regard to intestinal activity, the minimal dose that would suppress intestinal evacuation in the rabbit was determined and a few experiments have been performed on dogs with Thiry-Vella loops. In rabbits, the constipating dose of dilaudid was less than one-fourth that of morphine, while in dogs the same dose of each drug produced the typical modification of intestinal activity, particularly the increase in tone of the small intestine, characteristic of the action of morphine. Our experimental observations afford no explanation of the relatively weak constipating action of dilaudid reported clinically.

It should be understood that there are still many gaps in the experimental work on dilaudid, of which perhaps the most important are in relation to the questions of tolerance and addiction. We propose to undertake the investigation of these properties and to continue our study of the intestinal and emetic effects of the drug, as well as to endeavor to determine quantitatively its relation to morphine in sleep-promoting power. In the meantime, it would seem wise to delay the too rapid spread of the clinical use of the substance until the knowledge of its pharmacologic action is more complete.

CONCLUSIONS

It has been shown experimentally and clinically that dilaudid is powerfully analgesic and that, like morphine, it can depress the respiratory mechanism profoundly. At the same time, the experimentally established ratio between effective doses of morphine and dilaudid for the production of desirable effects is not materially different from the ratio between their toxic doses. *Clinical trial has not shown that dilaudid is free from tolerance and addiction evoking properties, and, while side actions such as nausea, vomiting and constipation seem to occur less frequently after it than after morphine, the prolonged administration of dilaudid should be entered on with as much caution as would be exercised with morphine itself.*

The references that have been given are believed to be complete so far as experimental work on dilaudid is concerned, and it is considered that the selection of clinical papers fairly represents published clinical opinion. I was assisted by Dr. H. M. Krueger in the review of the literature and also in the experiments on dogs, while the experiments on respiration were carried out by Dr. Charles I. Wright

50. Haffner, F.: Deutsche med. Wchnschr. **55**: 731 (May 3) 1929.
51. Weiss, Alfred: Arch. f. exper. Path. u. Pharmakol. **167**: 177, 1932.
52. Osman, Mehmed: Doktor-Diss., Geneva, 1930.
53. Römmelt, W.: Psychol. Arb. **9**: 435 (Feb. 20) 1928.
54. This investigation was supported by a grant from the Committee on Drug Addiction of the National Research Council from funds provided by the Bureau of Social Hygiene, Inc., and the Rockefeller Foundation.
55. Eddy (footnote 44): J. Pharmacol. & Exper. Therap., to be published.
56. Gottlieb,[2] Osman.[52]

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, APRIL 1, 1933

THE JOURNAL AND MEDICAL JOURNALISM

A STATEMENT BY THE BOARD OF TRUSTEES

Seldom in the past has space been utilized in THE JOURNAL to extol its own merit. Indeed, there has been little if any need for doing so. The increase in circulation, the material submitted for publication, the readiness with which subscribers have renewed their subscriptions, have been ample indication of their appreciation of what THE JOURNAL offers. During the last year, however, the world has been passing through what even optimists call a predicament. Great industries, to maintain sound financial status, have slashed their budgets, discharged employees, and in various other ways attempted to make both ends meet—financially. In the face of this situation the American Medical Association has carried on superlatively. THE JOURNAL has not lowered the standards that have brought it to its present high place in the field of medical journalism. It has not decreased the number of pages of reading matter in a volume. It has not raised its price to meet changing conditions and lowered income from advertising. Through efficient management it continues to develop sufficient income to carry on the multitudinous activities of the American Medical Association, although the margin now reached is barely in excess of those demands. In the face of this situation, nevertheless, a considerable number of physicians have begun the annual demand for a lowering of the price of subscription. In this connection it is interesting to report the results of several recent surveys of medical bibliography and of the place of THE JOURNAL in the medical bibliographic field.

The problem of the physician who subscribes to medical publications is to secure the maximum of usefulness with the funds available. There are published in the world today approximately eighteen hundred medical periodicals. Every one will grant that some of these are useless if not detrimental. Periodicals published by manufacturers of proprietary medicines, organs for propaganda issued by fly-by-night medical organizations, inferior publications issued merely to produce revenue from unacceptable accessories in the field of medical practice, hardly merit the name of medicine or of science in their titles. The *Quarterly Cumulative Index Medicus* indexes more than twelve hundred medical periodicals. In 1927, eminent librarians developed a method for determining the usefulness of a publication. They tabulated the references to it that appeared in a group of prominent publications issued throughout the world. R. L. Jenkins [1] undertook such a survey in the medical field and found that a study of the references in the *British Medical Journal*, the *Klinische Wochenschrift* and THE JOURNAL indicated that ten periodicals contained 35 per cent of the total references. THE JOURNAL led all other medical periodicals by far. Moreover, only 7 per cent of all bibliographic references antedated 1910, showing the value of purchasing current issues of leading periodicals rather than complete files of any publication, in building a useful medical library.

A similar study made by K. K. Sherwood [2] yields additional valuable information. Studying references that appeared in THE JOURNAL alone, he found that subscriptions to four magazines will supply the reader with one fourth of all noteworthy advances in medicine in the original articles. The leading fifty magazines contain 70 per cent of all noteworthy original articles. At present, he says, German is the most valuable foreign language for the use of an American physician. Finally, his studies showed the position of THE JOURNAL in the field of medical reference by revealing 411 references to THE JOURNAL, as contrasted with 82 references to the periodical next in line.

Because of the special problems created by the increasing cost of German medical publications, the Medical Library Association also has made a survey in this field. It was concerned especially with the cost of medical periodicals. Of particular value was the analysis of the per page costs of various publications. This analysis [3] reveals the fact that the per page cost of THE JOURNAL to a subscriber is approximately one-sixth (0.16) cent, as compared with one-half (0.51) cent for the *British Medical Journal*, three-fifths (0.64) cent for the *Lancet*, one-third (0.34) cent for the *Presse médicale*, one-half (0.44) cent for the *Deutsche medizinische Wochenschrift*, and one-half (0.46) cent for the *Klinische Wochenschrift*, which are of the same type. In the field of specialistic publications the following comparative page costs are of interest: The *American Journal of Diseases of Children*, one-fourth (0.28) cent, the *Archives of Internal Medicine*, 0.24; the *Archives of Neurology and Psychiatry*, 0.30; the *Archives of Dermatology and Syphilology*, 0.35; the *Archives of Surgery*, 0.45, and the *Archives of Ophthal-*

1. Jenkins, R. L.: Periodicals for Medical Libraries, J. A. M. A. **97**: 608 (Aug. 29) 1931.
2. Sherwood, K. K.: Relative Value of Medical Magazines, Northwest Med. **31**: 273 (June) 1932.
3. Robert, A. L., and Schaltenbrand, H. H.: The Comparative Cost of Medical Journals, Bull. M. Lib. A. **20**: 140 (April) 1932.

mology, 0.44, as contrasted with the *British Journal of Diseases of Children*, 1.88; *British Journal of Surgery*, 1.22, and *British Journal of Dermatology*, 1.71. Moreover, the German comparative figures are startling: *Deutsche Zeitschrift für Chirurgie*, 1.74; *Archiv für klinische Chirurgie*, 2.37; *Virchows Archiv*, 3.30, and *Zeitschrift für Kinderheilkunde*, 2.40. It is not surprising, therefore, that Dr. Fielding H. Garrison,[4] after an analysis of these figures, should write that THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION is, in respect of quantity and variety of material and illustrations, most reasonable of all in price, and, again, "Considering the profusion of photographic illustrations in THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, it is obvious that other expensively illustrated periodicals cannot compete with the A. M. A. journal in extent of sales and subscriptions."

The problem of subscription to German medical periodicals has become an exceedingly difficult one for American medical libraries to solve. There seems to be no reasonable limitation on the number of volumes issued during a year or even on the price per volume. In recent years, libraries have had to pay $92.25 for an annual subscription to the *Archiv für Dermatologie*, $173.30 for the *Zeitschrift für die gesamte experimentelle Medizin*, and $123.66 for the *Zeitschrift für Zellforschung*. Libraries that wish to keep up with German medical publications are being compelled to pay 70 per cent of their available money for German periodicals. They would not seem to be worth it. As a result of this analysis a special committee has addressed a letter[5] to German scientific societies and editors asking them to make some attempt to decrease the size and number of volumes through briefer articles and careful editorial selection, and to arrange for fixed annual subscription prices, determining in advance the number of volumes appearing throughout the year.

The American Medical Association is to be congratulated on making available to the medical profession what is shown by analysis to be the leading medical journal of the world at the lowest price comparatively of any medical publication in the world. Membership and Fellowship in the American Medical Association give to the holder more for his money than is offered by any other scientific organization in the world and at a far lower price, even eliminating the vast services that are offered. Thus, members of the American Physicists Association pay $10 and $15 annually; the American Chemical Society, $15; the American Bar Association, $8 annually. Moreover, members of the British Medical Association pay $15 annually. Consider in this connection such services directly to the individual practitioner as the package library service, the bibliographic reference service, the answers to queries on every conceivable medical subject, and such general services as the *Quarterly Cumulative Index Medicus*, the work of the Bureau of Investigation, the Councils, Bureaus and Committees on Pharmacy and Chemistry, Physical Therapy, Foods, Medical Education and Hospitals, Health and Public Instruction, Legal Medicine and Legislation, most of them not duplicated by any other medical organization in the world, and one begins to attain some realization of what medical organization in this country represents and what it has accomplished.

Let us now be quite frank. This editorial has been written because of a certain minimal amount of agitation to lower the price of THE JOURNAL. To do so will mean certain reduction in both the amount and the quality of service that the Association is able to render to its members. Already there has been shrinkage of the working force to the bare essentials and a reduction of salaries for employees, none of whom have ever been paid salaries proportionate to those of similar positions for other organizations and certainly not for workers in commercial fields. The Association must maintain an adequate reserve to sustain its independence and to guard against disintegration and destruction. Since, as has been shown, members now pay far less than is paid for membership in any similar body in any country in the world, and since, as has been shown, they receive for their payment far more than is received by members of any similar body anywhere else in this country or abroad, reduction in the price of Fellowship or subscription should not be undertaken at the risk of hampering the work of the organization.

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JOSEPH A. PETTIT	

HOSPITAL INSURANCE PLANS

Already in various communities some hospitals have embarked on hospital insurance plans with a view to solving their own financial problems, and perhaps with a view to taking advantage of the interest created by recent discussion of the costs of medical care. The Committee on the Costs of Medical Care in its majority report recommended voluntary insurance or group payment as a means of solving problems in the medical field, whereas the minority was inclined to condemn such plans as leading directly to compulsory insurance and state medicine. In THE JOURNAL, last week, some of the factors of danger involved in such plans were indicated. The diversity of plans offered, the disruption already apparent among hospitals and physicians in some parts of the country, and the propaganda used to promote "pet" schemes by interested endowments, are indications of the seriousness of the situation and of

4. Garrison, F. H.: The High Cost of Current Medical Periodicals, Bull. M. Lib. A. **20**: 165 (April) 1932; reprint issued by the Medical Library Association, J. C. Harding, 11000 Euclid Avenue, Cleveland.

5. Letter sent to German scientific societies and editors asking their cooperation in bringing about a reduction in the cost of current German periodicals, Bull. M. Lib. A. **21**: 90 (Jan.) 1933.

the need for more careful consideration than seems to be given to these problems by most hospital organizations and medical societies.

It is refreshing in the midst of such doubts and disturbances as now assail the profession to find so cogent and pertinent a criticism of insurance as has just been offered by Dr. Samuel C. Harvey [1] in his presidential address to the New Haven County Medical Society. He says:

> There are certain essentials in providing any insurance. One is to limit the scope of the insurance to a field sufficiently narrow so that accurate figures may be obtained from which the actuarians may estimate the probable losses with a considerable degree of certainty. A second is the setting up of sufficient reserves to cover with complete safety any possible eventualities, and this requires capital. A third is that the insurer does not enter into the business of replacing losses in kind but only supplies the funds with which to replace such losses. An insurance company does not rebuild a house destroyed by fire, for this would mean entering into an entirely foreign field of activity which can be more efficiently and satisfactorily done by those already engaged within it. A fourth is that some mechanism be provided by which the insurance is sold with knowledge and skill so that it may be adapted to the needs of the individual concerned. A fifth is a sufficient spread of the field of the insured so that disaster to any one group will not destroy the reserves of the insurer. Taking all these things into consideration, it seems absurd to suppose that amateurs can offhand enter into the field of insurance and accomplish something that the professional organizations have not yet found themselves able to do. A customary statement is to the effect that removing the profit from insurance would enable this to be done with less cost, but unfortunately this also removes the expert in insurance matters, with the result that the gain by abolition of profit is more than balanced by the loss in efficiency. I believe, then, that if insurance is to be developed to cover the costs of medical care it must be done by those who are experienced in this activity, and that in practice means by reputable insurance organizations already in existence. Any other attempt will lead to subsidy by taxation, and where the state spends its funds it controls. There then grow up bureaus which contain within themselves the incentive to further growth, the only restraint being the exhaustion of the taxpayer. And the consumer always pays, but then by taxation through an intermediate body which necessarily abstracts from his dollar so that by the time it reaches the producer its purchasing value is sadly reduced.
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> With these reservations in mind, it would seem advisable to attempt to pick out some part of the costs of medical care which might be susceptible of insurance. Inasmuch as the largest factor in the serious illness is the cost of hospitalization, this would seem the logical point of attack. This has, of course, been long recognized and various attempts are being made by hospitals and groups of individuals, some of which are organized as corporations to provide insurance. None of these complies with the indications which have been stated above and therefore I believe they are essentially unsound and doomed to failure without they obtain subsidy from philanthropy or the state. That professional insurance organizations should study this problem in conjunction with hospitals and representatives of the medical profession seems obvious. The answer would seem to be in general along the lines of coverage, not complete but approximating actual hospital costs, for the use of plant and in addition limited coverage for professional fees, the disbursement to be made to the patient, the hospital and physician having, however, a primary lien upon such monies. With these limitations it should be possible to write an insurance the cost of which would fall under normal circumstances within the scope of the present average budget of the majority of families.

1. Harvey, S. C.: Oikonomia Medika, Yale J. Biol. & Med. **5**: 323 (March) 1933.

As was pointed out in our editorial last week, the presence of serious if not incurable ailments invariably gives rise to quack doctors, herb doctors, and recommendations by amateurs. The desires of financially innocent hospital executives, in this emergency, to participate in systems of insurance in which they and the institutions they represent bid fair to become the tools, if not the marks, of astute salesmen and commercial promoters would be ludicrous if they were not so sad. Every physician and hospital director should ponder well the five essentials emphasized by Dr. Harvey in the statement here printed. They will do well to consider the results in communities which have already experienced the failures that he prophesies. Let us not too lightly sacrifice what modern medicine and the modern hospital have achieved in our attempt to gain the utopia which the Committee on the Costs of Medical Care so airily prophesies.

QUANTITATIVE CONVERSION OF CAROTENE TO VITAMIN A

In 1919 Steenbock [1] called attention to the similarity in the distribution of vitamin A and the yellow plant pigment carotene. Up to that time vitamin A had been recognized as a dietary essential for less than ten years, but many food substances had already been assayed for this factor and its natural distribution was fairly well defined. Yellow corn, yellow turnips, carrots and sweet potatoes were recognized as sources of the vitamin, whereas white corn, white turnips and white potatoes were not rich in this food factor. During the following ten years little attention was paid to this remarkable correlation between vitamin A potency and the pigment carotene; but within the past four years the intimate relationship between these substances has been demonstrated repeatedly by both chemical and biologic experimental methods. It is at present well established that the plant pigment carotene is transformed to vitamin A in the animal body. They are not identical substances: carotene is yellow, whereas vitamin A has little color; vitamin A exhibits an absorption of light of wavelength 328 millimicrons, carotene does not; both give a blue color with antimony trichloride but that with vitamin A shows an absorption band of 619 millimicrons, whereas that with carotene absorbs light of wavelength 590 millimicrons. Carotene is a crystallizable hydrocarbon with a cyclic structure, related to the terpenes, and the recent evidence indicates that vitamin A is probably a primary alcohol derivative of one half of the carotene molecule. On purely theoretical chemical grounds, therefore, it is reasonable that vitamin A should be derived from carotene. Indeed, the repeated demonstration of the vitamin A potency of carotene has led to the adoption of 0.001 milligram (1 gamma) of crystalline carotene as the international unit standard of vitamin A.

1. Steenbock, Harry: Science: **50**: 352, 1919.

Although there is a considerable mass of evidence relating to the qualitative relationship of carotene to vitamin A, only recently have studies been reported bearing on the quantitative transformation in the animal body. Morgan and Madsen [2] determined by chemical methods the carotene content of fresh apricots and also the influence of freezing, drying and sulphuring on the amount of pigment remaining in the treated fruit. The loss of carotene in the dried fruit was about 40 per cent. The vitamin A potency of the apricots was then determined, as well as that of highly purified crystalline carotene, by the usual method of biologic assay depending on growth. When the gain in body weight of the experimental animals was related to the content of carotene in the fruit, it was found that the biologic value of fresh and of sulphured sun-dried apricots may be considered to be approximately 100 per cent of the expected value based on carotene determinations in these fruit samples.

The California studies, which are among the first to attempt to obtain a quantitative estimation of the transformation of carotene to vitamin A in the organism, indicate that within the possibilities of the present chemical and biologic methods of analysis the conversion of this plant pigment to vitamin A is nearly complete. Morgan and Madsen call attention, however, to the inevitable variations that might be expected in this relationship due to differences of absorption of the carotene, which depends, in turn, on the nature of the plant tissue of which it forms a part. It is on such quantitative measurements as these that the final chapters of the fascinating story of the biochemistry of vitamin A will be based.

Current Comment

PYRIDINE DERIVATIVES IN THE URINE

In view of the multiplicity of chemical compounds that make up the ordinary diet of man, it is striking that the accepted picture of those chemical transformations which constitute metabolism can be reduced to a relatively small number. This is especially pertinent to the changes occurring among the compounds of nitrogen in the body. A comparison of the known nitrogenous substances consumed with the number of compounds that account for the bulk of the nitrogen in the urine emphasizes the relatively few chemical pathways along which the great part of these changes are brought about. On the one hand is the diet with its large number of known compounds of nitrogen and certainly some unknown ones; on the other is the urine, almost all of the nitrogen of which can be accounted for by urea, uric acid, creatine-creatinine, hippuric acid, and ammonia. However, approximately 5 per cent of the urinary nitrogen is customarily reported as "undetermined," consisting of unusual compounds present in such small concentrations that the task of separation and quantitative determination is made extremely difficult. A recent contribution to our knowledge of the make-up of this "undetermined" nitrogen of the urine has been made by Linneweh and Reinwein.[1] These investigators applied the Kutscher method of separation of bases with silver to 40 liters of urine and, after further manipulation, obtained 0.6 Gm. of pure trigonelline chloride and 0.31 Gm. of methyl pyridinium hydroxide. These substances are of interest because both are simple derivatives of the cyclic nitrogenous compound pyridine. The pyridine nucleus occurs in many alkaloids and trigonelline itself is widespread among the plants, notably in coffee. Furthermore, it has been shown that in the animal body trigonelline is derived from nicotinic acid, a derivative of nicotine. Less is known of the probable origin of methyl pyridinium hydroxide, though it has been said to arise from coffee during metabolism. Certain it is that the discovery of these unusual compounds in the urine will serve to call attention to the related compounds, in the food and their ubiquitous distribution. However, the question of greatest biochemical interest, namely, the manner in which the body handles these unusual and probably toxic substances, awaits the determination of the chemical nature of the combination of the pyridine derivatives as they occur in the urine.

2. Morgan, A. F., and Madsen, E. O.: J. Nutrition **6**: 83 (Jan.) 1933.

1. Linneweh, W., and Reinwein, H.: Ztschr. f. physiol. Chem. **207**: 48 (April 20) 1932.

Association News

ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE

Twenty-Ninth Annual Meeting, held in Chicago, Feb. 13 and 14, 1933

DR. RAY LYMAN WILBUR, Washington, D. C., in the Chair

COUNCIL ON MEDICAL EDUCATION AND HOSPITALS

FEBRUARY 13—MORNING

Report of the Chairman of the Council on Medical Education and Hospitals

DR. RAY LYMAN WILBUR, Washington, D. C.: During 1932, 642 hospitals were visited by members of the Council's staff. A wide range was covered, but emphasis was placed on (*a*) those hospitals that were approved or seeking approval for intern training, and (*b*) those hospitals approved or seeking approval for residencies in the specialties. Following out the action of the House of Delegates, the visitation of the hospitals for the mentally ill, 632 in number, has been practically complete. A beginning has been made in the inspection of hospitals for the treatment of tuberculosis, and also of the Negro hospitals, and at the request of the House of Delegates it is planned during the coming year to spend some time in studying the needs of small hospitals. Also, at the request of the House of Delegates, an analysis is being made of the staff membership of registered hospitals for the purpose of determining what percentage of the staff are members of the American Medical Association.

During the last fifteen years, the number of hospitals offering suitable training for interns has increased so that in 1932 the number of places available in approved institutions exceeded by 25 per cent the number of graduates from recognized schools. As hospitals are constantly striving to secure this approval, it is evident that this proportion will become greater. It is suggested that a solution of this difficulty may be found in extending the average duration of the internship.

The Essentials of a Registered Hospital have been revised so as to bring them up to date and the new statement has received the approval of the House of Delegates.

The report on hospital service was published in THE JOURNAL, June 11, 1932.

Hospital Practice, a handbook of useful information for interns, has been completed and is ready for distribution.

In some parts of the country, osteopaths and even chiropractors have claimed the right to practice in tax supported hospitals. Thus far the medical profession has been successful in persuading boards of management that the interest of the public is best served by excluding cultists from hospitals.

The Council has prepared and published during the year lists of physicians specializing in radiology and pathology. Formerly the Council approved laboratories in which radiologic or pathologic examinations were made. Experience, however, seemed to indicate that it was more important to analyze and appraise the qualifications of the individual who might be practicing radiology or pathology than to place the seal of approval on certain premises or organizations engaged in these fields. To this end, the Essentials for Physicians Specializing in Radiology and Pathology, respectively, have been revised and in their new form have received the approval of the House of Delegates.

The Council is also prepared to extend to other special fields of medicine the service which it has rendered in the fields of radiology and pathology, to the end that members of the medical profession and others who may be concerned may be able readily to distinguish those who have received training in the various branches of medicine from those who are merely self constituted "specialists."

During the past year, no additional medical schools have been approved. The University of Mississippi School of Medicine has been continued on probation.

The Essentials of an Acceptable Medical School have been revised in collaboration with a committee of the Association of American Medical Colleges.

A study has been made of the number of students repeating a part of the medical curriculum because of poor scholarship. Whereas seventeen schools had none repeating, a few schools had more than 10 per cent. It is of even greater concern that, in some instances, students who have failed utterly in the regular examinations have been promoted by executive order so as to avoid the necessity for reporting "repeaters." The executive order in medical education will have to be looked into.

Within the last five years there has been a larger number of technically qualified applicants than the medical schools of this country have been able to receive. Some of those who have been rejected, and many others who are not technically qualified, have migrated to European universities with the expectation of returning to this country to practice. At present there are probably 2,000 such American medical students abroad. In order to deal with this problem, the Council has brought together informally representatives of interested bodies for the purpose of discussing ways and means of protecting this country from men and women who may not be fully prepared. As a result of these conferences, it is hoped that uniform action may be taken by state boards throughout the country to exclude from their licensing examination all who have not fully met the prevailing standard of medical education in this country.

During the past year there has been published in revised form A Standard Classified Nomenclature of Disease, which, if it could come into general use, would greatly simplify hospital records and add enormously to their value.

I have tried to give some impression of the principal functions of the Council. It will be noted that certain real problems remain: for instance, the matter of the student educated in foreign institutions who expects to return to America; the hospital and what shall be done with it under existing conditions; whether such work as has been done for the radiologists shall be extended to the other fields of medicine.

Results of the Work of the Commission on Medical Education

SAMUEL P. CAPEN, PH.D., Buffalo: This will appear in full in THE JOURNAL.

DISCUSSION

DR. STANLEY RYERSON, Toronto, Ont.: The report conveys the idea that medical training needs revision so that (1) recognition is given of the concept of medicine as a social agency; (2) clinical methods will be brought into closer relationship with the fundamental sciences; (3) prevention, as a means of medical aid, will permeate the whole course; (4) the care and treatment of the patient, rather than of the disease, will be taught and, as Chancellor Capen has pointed out, medical education will constantly have to be recast and rearranged. A further point that the report suggests is the importance of the psychologic aspect of medicine. Twelve years ago, psychology was introduced as an elective course in the first medical year of the course at the University of Toronto. Students who might be interested in this mental aspect of practice followed this elementary course by other electives in practical psychology, abnormal psychology and psychiatry in the succeeding years. The number of students taking the introductory course as an elective had increased by 1931 to 70 per cent of the whole class, so last year psychology was incorporated into the first medical year as a compulsory course for all students. I think the time has come when psychology has to be recognized as one of the fundamental courses in the medical curriculum. "The course should be regarded as a unit and the instruction in individual departments ought to be presented with respect to the whole," reads the report. The fact that such a point of view does not exist at present is abundantly evident, with courses in anatomy taught as though the object were to train anatomists, in physiology to produce physiologists, in pathology to produce pathologists, in surgery to create surgeons. The statement of the curricular requirements and the methods used in instruction create the impression in the mind of the student that each subject is a unit in itself, a completion of the knowledge of which he is expected to accomplish in the time devoted to it. There is a textbook in each subject containing such a mass of information, the relative values of which he is unable to determine and the quantity of which is so great, that a picture of the subject as a coordinated whole, such as the structure of the body as a unit or the functions of it, is beyond his comprehension. If the idea of the unity of the course could be inculcated, the student will realize that, as the report says, "the educational sequence from premedical education to retirement from practice should be looked on broadly as a single problem, not a succession of isolated and unrelated experiences."

Whether that part of the Report on the Education of Medical Students adequately fulfils the first purpose of the commission of "making a study of the educational principles involved in medical education" is open to question in the minds of many. A study of whether the educational methods at present being used in medical colleges are based on sound educational principles does not appear to have been conducted or reported on as a specific investigation. That a solution to the problem of medical education is being sought in medical schools everywhere today is apparent. The one factor of this problem which is common to all medical colleges is that set down as the first purpose of the commission; namely, the educational principles involved. Should not a scientific study be made of the present principles of education that are in operation in the medical course? Are the methods used in instruction in accordance with accepted principles of education? Is the present method of teaching anatomy conducted in accordance with modern educational principles? Does the present method of laboratory work justify itself in the results obtained? Is the clinical teaching carried out in accordance with the principles laid down in the case study method of education? Is teaching done with an understanding of the learning processes of the student? Is the sequence of courses and the correlation of courses such as to make the course a unified whole? How can a shift in the interests and point of view of those in charge of medical education be brought about regarding the training of students and the new philosophy of medical responsibility? Books, journal articles and meetings have been drawing attention to the defects of medical education for ten or fifteen years and yet nothing has happened as yet to remedy effectively its weaknesses. The time has come when action by investigation of educational principles must be taken, if we hope to train adequately and effectively the medical man of the future to meet the professional, social and economic responsibilities that the report envisions.

An unprecedented opportunity exists for this association and the Association of American Medical Colleges to cooperate in instituting an investigation of educational principles and meth-

ods as they now exist in a representative number of medical colleges by one or more authorities in the field of professional education. I am aware that opposition exists to such a procedure for fear that it might jeopardize the freedom and independence of medical educators or interfere with the creation of the scientific and research point of view. Just as the fear of undergoing a physical examination by the patient is due to his ignorance of the value of the information that may be gained, so is the fear of an educational examination of the medical course based on a lack of appreciation and understanding of the present-day science of education. Education as a science has the same status in the American Association for the Advancement of Science as the medical sciences and is an established section of this body. Instead of the newer methods of education leading to a greater tendency to schoolboy teaching, to greater rigidity, to more formality, to increased lockstep, to the return of the pedagogue of fiction, the whole basis of their philosophy depends on a steadily decreasing part taken by the teacher in his endeavor to educate the student to educate himself. The report endorses many of these newer principles in which a change in point of view is necessary. Why, where, when and how these new educational principles should be introduced into medical courses, can be discovered only by an educational survey by a trained educationalist.

In 1929, after a joint study committee of the Canadian Medical Association and the Canadian Nurses Association had given a good deal of thought and study to the problem of nursing education, it was agreed that nothing short of a thorough investigation by a competent experienced person should be secured and they procured Prof. George Weir, head of the department of education in the University of British Columbia, for this work. The "Survey of Nursing Education in Canada" was published in 1932. Why be afraid of such a procedure? If a similar survey is made of medical education, I am confident that the knowledge and information obtained, when considered along with this report, in which the professional aspects are dealt with so comprehensively, will enable universities and medical colleges to provide an eminently more satisfactory and effective medical education.

Some Phases of Medical Education in Europe

DR. ALAN GREGG, New York: In June, 1924, I was sent by the Rockefeller Foundation to study medical research in Europe, spending about half the time in our Paris office and the other half in visiting and revisiting almost all the countries in Europe. I remained until January, 1931. The European universities had origins and initial circumstances quite different from those of universities in America. The first European universities began in many instances as spontaneous and rather informal segregations of scholars out of an established feudal society. The earliest universities in the United States began as colleges because the ministers of the Gospel and the teachers among the colonists were faced with the necessity of recruiting and training teachers and preachers for the colonists. Quite apart from historical considerations, there are other circumstances of a sociological category that affect medical education in Europe. Some of the implications of a dense population, as contrasted with a sparse settlement of the country, may be considered first. Norway, Sweden, Finland, parts of Russia, and even Scotland are countries where settlement is sparse in comparison with France, Germany, Belgium or Italy. The sparseness of settlement has a direct effect on medical school policy, since it is likely that the medical graduate will go to a community where there is within easy reach neither professional help nor professional competition. This sparseness of settlement means that the doctor must be reasonably well trained to meet a great variety of emergencies and sicknesses. It is, I think, quite natural that in these countries one finds implicit in the policy of the medical schools a definite sense of responsibility to turn out medical graduates that shall be competent and not dangerous, broadly trained and not narrowly specialized. Now, in countries of dense settlement one notes, on the other hand, the tacit and justifiable assumption that after graduation competition will do much that the medical faculty need not do, and perhaps cannot do, in giving long apprenticeship and intensive experience to the young doctor. It is hardly possible in Belgium for a young graduate to be the only physician in a wide area. He enters competition with others, and he must wait for the maximum responsibilities. It is common to see only 80 candidates successful in a competition of 800 for the most desirable posts. I think that in the United States we are suffering inevitably from the fact that we have both types of settlement, and that no single school can count on producing students exclusively for one or the other set of conditions. Closer examination of the sparsely settled countries of Europe leads to another consideration. Though sparsely settled, they contain the maximum population that can be sustained. The competitive life in Europe impressed me as more like a race in a narrow street. If one is at the very front, one can go very fast to find one's reward, but almost anywhere else the problem is not only to go fast but to keep from being run over by a competitor all too ready to take one's place. It may not be that we shall ever have in the United States the same ever-present competition that is characteristic of European universities, but, on the other hand, some day we may approach Europe in population density and the effect it brings.

In academic circles it is a competition not only for a livelihood but for place. European society gives to the professor-doctor especial recognition. Family pride is involved in this struggle for place, and pressure from all quarters concentrates on the student, not only in the university but in the secondary school perhaps as much or even more. The competition for place is a competition of endurance as well as speed, and longer training and broader training are the qualifications offered by the successful competitors. It is common to see a very close relationship between, say, a professor of clinical medicine abroad and his assistants, but not so close a relationship between the professor and the average run of students. From this relation with assistants have developed the so-called academic families, and the academic past of any young man is an important and widely known item in the evaluation of his real worth. In justice to professors who are almost victimized by this competition, I would suggest that it may in part explain the preoccupation in the eyes of casual visitors which seems to characterize some of the best men in the clinics and laboratories of Europe. I have seen this preoccupation misinterpreted again and again and I do not think that it is fair to attribute to it the interpretation that would be placed on it in the United States.

It is not sensible to attribute too much to the necessities of competition, but there is an almost inescapable conclusion that it results in a special sort of intellectual maturity in the young European which is not so commonly found in so-called younger countries. Naturally, attention in Europe is sharply concentrated, therefore, on the method of the selection of men for important positions. There is a degree of discrimination in the estimates of intellectual ability and character; there is an amount of rivalry, not always of an edifying sort; there is a tendency to widen the field of choice; there is a solicitude for creating methods of proving quality before the final choice; and there is even an amount of dickering with the actual nominee for a professorship which is interesting and impressive. One sees young Germans obliged to leave the university of their choice, since they can get the coveted position only if they are called back to it. My attempt, therefore, is to pass on in this brief talk one or two facts which, I came laboriously to realize, are some of the considerations to bear in mind in interpreting the facts of medical education abroad.

DISCUSSION

DR. E. P. LYON, Minneapolis: As I read over Dr. Gregg's paper, the following struck me as notable points: The first is the desirability that we study medical education in other countries, in Europe, and that we draw from there ideas for use in our own situation. The statement to the effect that some were beginning to think of medical education as self education ought to be the predominant thought in all our minds in the coming years. I think we have come to the time when standardization of curriculums and the dealing out of so much material which is to be taught is past. I think that means that we shall pay less attention to curriculum, to pedagogic details, to classwork, to the details of tenets, and so on, and that we shall bend every effort to tell the student that he has to get the stuff for himself and that what he will be will depend on how much he is able to make himself self educated, and it is not our business at all to educate him. In regard to the author's discussion of the difference in training to fit

people for places of less versus more dense population, I have not any definite opinion. Probably it is true that our students being educated in modern, highly equipped hospitals get less of the methods which would be used in out-of-the-way places to accomplish the same result, perhaps lose inventiveness, and perhaps are less able to tackle the situation in the country than students formerly trained. I feel that perhaps there should be among clinical teachers more of an effort to call attention to methods which can be used when the equipment is less extensive than that which we have in the teaching hospitals.

Regarding specialists' training, I have a feeling that we are past the period of the six weeks specialist, and that the young men nowadays who go into specialties make up their minds beforehand to a long period of training. There are certain important things that Dr. Gregg left out. The first is that there is a tendency to a definite overcrowding of the medical profession, and I think the meeting of that emergency is the greatest problem now before medical educators. One cannot sit in a dean's chair and notice the struggle of young men to get located compared with twenty years ago and not be struck with the fact. I have thought, "How can it be settled under our American conditions?" and I must say my mind is very hazy; but I feel that the basic movement must come from the medical profession represented by the American Medical Association and from the medical educators as represented by this body and the Association of American Medical Colleges. I feel that the most drastic steps should be taken to meet it. And I favor such drastic steps on the sociological argument that it is bad for the people. Anything that tends to overproduction in the medical profession tends to the outcropping of all that is bad in medicine. At present the medical profession is a high-minded, honest and reliable profession, taken as a whole, but in its midst there are always some shysters, some quacks, some abortionists, some men who have not been impregnated with the ethics of the profession. When the exhibitions of competition become more drastic, I am certain that every one of those tendencies in the wrong direction will be exaggerated. As a protection for the whole people and not for the medical profession alone, I strongly advocate that we get right at this job to find out where we are standing.

DR. DEAN LEWIS, Baltimore: I was glad to hear Dr. Gregg say there are three things absolutely necessary in the education of the medical student. The first is observation, the second is reasoning, and the third is a knowledge of literature. In our present-day system of education they have very little of either. I have seen a great deal of interest in the statement that all education should be self education. In surgery, self education in fracture results in such things as crippling a patient in a case of fracture of the femur. That is self education, but it is hard on the patient. So far as the teaching of surgery is concerned, there are certain things a man has to know before he can take care of patients. In the first place, he has to know in the treatment of fractures the difference between a long fragment that he can control and a short one which he cannot control, and he does not learn that unless somebody tells him. There will be a lot of cripples if he goes on self education. Self education does not apply so far as surgery is concerned. There are certain things that one has to teach the student, and then he has to reason and observe. There are things that he has to be told repeatedly, and it is often repetition that gives the medical student the best part of his training. I also think there has to be a certain amount of discipline. There is a tendency among medical students to choose the things they like because they are easy.

DR. AUSTIN A. HAYDEN, Chicago: There is a question brought to mind by the diagram that is on exhibit outside the door, regarding the overcrowding of physicians in certain countries. I was surprised to learn that America has the greatest density of physicians per population and that the country that is second in physicians to population is Spain. Dr. Gregg's observations, he says, have been gathered from the interviewing of professors, of government agents, and of medical educators in general. As a private practitioner of medicine, I should like to call attention to the fact that there is such a thing as a patient, and that there is such a thing as a private practitioner of medicine, on which these professors and government agents depend for the actual delivery of medical service to sick people.

DR. ALAN GREGG, New York: I think that the point that Dr. Hayden brings out is partially answered by the fact that so far as I know none of the professors with whom I spoke were full time professors. They were all doing some practice. A good many of them, if not the majority, had been doing practice quite apart from the universities previous to their university appointments. I did not use the word "self education" because it happens that I think that very rarely happens in pure culture. But what I think does happen is that the pressure and the seriousness of life that surround the European student make him realize that he is responsible and it is for him to choose people who will do teaching for him. A young man in Europe knows his professional circumstances are more serious than we have in this country. His education, in order to get into the school, is settled when he is about 13 or 14 years old, by being put into a course. So the load for the parents is one that begins at 13 and finishes around 27 or 28, but it really goes on further than that because one doesn't do very well in the first ten years. The parents have got to be ready to make at least supplementary support for their children during the years immediately following the obtaining of their degree and apparent entrance into practice. That reflects itself in a serious way in the whole atmosphere of society. The students feel it, and they don't get annoyed with some one who has to get something. Family reputation is involved, financial stability is involved, freedom of action is involved, and self respect is involved. They can't play with that. I am talking about the better grade of Europe. I know in Europe that there are a number of casual students, but I am not telling you what goes on in Europe in a judicious frame of mind, because then I should say we have certain things we can learn from Europe, and there are certain things in which we are doing better than they are doing in Europe. I would agree with Dr. Lewis that there are large fields in medicine where teaching must take place, but what I want to point out is that in Europe it is probably a little bit less of the item of pressure from teacher and a little bit more of the item of succession from student, and that that is responsible for its being possible to leave to a certain extent some of the decisions regarding how much he shall take of this or that to the student. The very best men are the men most eager to get under the prolonged tutelage. It isn't a question of self education. They want to get under the prolonged tutelage of good men, and they will sell their souls to do it. The competition is strict. To answer the question Dr. Hayden raised about Spain, the degree of Doctor of Medicine has in Spain a certain social value. When in Brazil I knew lots of professional politicians who went through school to get a degree of Doctor of Medicine. I feel that in Spain it is more than likely that the same factor is in play. There is also almost a perfect difference so far as what happens to the tail end of the profession. There are plenty of doctors in Spain not practicing because there are not enough persons to practice on; they are registered as doctors but are probably doing something else. They keep up their registration. I don't think that explains all of it, but it is enough to be a partial explanation.

Comments on the Internship

DR. WILLARD C. RAPPLEYE, New York: This article appeared in full in THE JOURNAL, March 25, page 873.

DISCUSSION

DR. VERNON C. DAVID, Chicago: Rising from the rank of medical student to that of a responsible house officer and therefore coming into much greater personal relationship with his attending man, one has a great opportunity to set an example in the moral issues involved in the practice of medicine. The influence of the late Frank Billings on his house officers is a case in point. Scientific honesty, kindliness, equal interest in rich or poor, absence of sham or front, an appreciation of the changed psychology of the sick and a whole string of equally homely virtues developed a morale far removed from thoughts of fee splitting, commercial practice, too lofty dignity or careless work. There are not many Billingses, but every attending man can develop moral perspective in his house staff. It would seem important that men should have a rotating intern service. The surgical internship is not a proper place for training in operative technic but rather is an opportunity for further study of surgical principles. The intern should

make independent rounds and dressings as well as those made with his attending man, should do the laboratory work in his cases, should study the microscopic changes in specimens from his service, and should have and take time to read about his cases. Those things are on the shoulders of his attending man.

(To be continued)

MEDICAL BROADCAST FOR THE WEEK

American Medical Association Health Talks

The American Medical Association broadcasts on Tuesday and Thursday from 9:15 to 9:20 a. m. (central standard time) over Station WBBM (770 kilocycles, or 389.4 meters). The subjects for the week are as follows:

April 4. A New Deal in Food Advertising.
April 6. Chocolate.

There is also a fifteen minute talk sponsored by the Association on Saturday morning from 9:45 to 10 o'clock over Station WBBM.

The subject for the week is as follows:

April 8. Heart Pains and Palpitations.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ALABAMA

State Medical Meeting at Montgomery, April 18-21.—The sixty-sixth annual meeting of the Medical Association of the State of Alabama will be held in Montgomery, April 18-21, under the presidency of Dr. Samuel Kirkpatrick, Selma, and with the Montgomery County Medical Society as host. The governor of Alabama, Hon. B. M. Miller, the mayor of Montgomery, Hon. W. A. Gunter, and the president of the county medical society, Dr. Charles E. Robert Parker, Montgomery, will give addresses of welcome. Dr. Kirkpatrick's speech will be on "Contributions of Medicine to Civilization." The scientific program will include the following physicians as speakers:

Harold E. Simon, Birmingham, Clinical Syndromes of the Surgical Spleen.
Harry R. Cogburn, Mobile, The Scope of Dermatology.
Emmett B. Frazer, Mobile, Hematuria: Its Great Significance.
John F. Yarbrough, Montgomery, Acidemia: Its Relation to Chronic Disease.
James R. Garber, Birmingham, Prophylaxis in Labor.
John E. Walker, Opelika, Hypothyroidism with Particular Reference to Its Cardiac Complications.
Charles E. Robert Parker, Montgomery, Celiac Disease—Chronic Intestinal Indigestion.
Harry A. M. Simpson, Florence, Incidence of Mental and Nervous Manifestations in Internal Medicine: Review of 100 Cases.
James Harold Watkins, Montgomery, The Mechanism and Significance of Heart Pain.
James H. Dodson, Mobile, Consideration of Some of the Anatomic Structures Dealt with in Treating Anorectal Diseases.
Alfred S. Frasier, Dothan, Acute Osteomyelitis.
George S. Graham, Birmingham, Identification of Cancer Cells in Serous Fluids as a Diagnostic Measure.
Samuel L. Ledbetter, Jr., Birmingham, Congenital Pyloric Stenosis.
John D. Sherrill, Birmingham, Ununited Fracture of the Neck with the Femur.
Walter F. Scott, Birmingham, Prostatic Resection—Its Limitations and Complications.
James M. Mason, Birmingham, Traumatic Arteriovenous Aneurysms.

A public meeting, Wednesday, will be addressed by Drs. Dean Lewis, Baltimore, President-Elect, American Medical Association, on "Medical Problems Confronting the Medical Profession," and Irvin Abell, Louisville, on "Recent Contributions of Science to the Field of Medicine." Dr. John Shelton Horsley, Richmond, Va., will deliver the Jerome Cochran Lecture on "Cancer of the Stomach and Colon." Other guest speakers will include:

Dr. Roy Wesley Scott, professor of clinical medicine, Western Reserve University School of Medicine, Cleveland, Clinical and Pathological Observations in 2,000 Cases of Cardiovascular Disease.
Dr. Wiley R. Buffington, professor of ophthalmology, Tulane University of Louisiana School of Medicine, New Orleans, Diagnostic Importance of the Eye.
Dr. Hugh J. Morgan, professor of clinical medicine, Vanderbilt University School of Medicine, Nashville, Thomsen's Disease: A Clinical Study.
Dr. Robert G. Carothers, Cincinnati, Treatment of Fractures of the Ankle.
Dr. Frank K. Boland, professor of clinical surgery, Emory University School of Medicine, Atlanta, Differential Diagnosis of Abdominal Tumors.
Dr. Fred W. Rankin, Lexington, Ky., Curability of Cancer of the Right Colon.
Dr. John J. Shea, Memphis, Tenn., Management of Fractures of the Facial Bones.
Dr. Raphael E. Semmes, associate professor of surgery, University of Tennessee College of Medicine, Memphis, Head and Brain Injuries.

A symposium on Bright's disease will be given by Drs. James S. McLester, Birmingham, Monroe A. Maas, Selma, and Frederick W. Wilkerson, Montgomery.

ARIZONA

Bill Enacted.—H. 46 has become a law, requiring all applicants for licenses to practice the healing art, as a condition precedent to examination by their respective "professional" boards, to pass examinations in anatomy, physiology, pathology, chemistry, bacteriology and hygiene, to be given by a board of examiners in the basic sciences.

ARKANSAS

Bill Enacted.—S. 361 has become a law, according physicians, dentists, nurses and hospitals treating persons injured through the fault of other persons liens on all rights of action, claims, judgments, settlements or compromises accruing to the injured persons by reason of their injuries.

CALIFORNIA

Health at Long Beach.—Telegraphic reports to the U. S. Department of Commerce from eighty-five cities with a total population of 37 million, for the week ended March 18, indicate that the highest mortality rate (24.6) appears for Long Beach, and the rate for the group of cities as a whole, 12.1. The recent earthquake in California, which caused its greatest devastation in Long Beach, is responsible for the resultant increase in the mortality rate. The mortality rate for Long Beach for the corresponding period last year was 11, and for the group of cities, 13.9 The annual rate for eighty-five cities was 12.4 for the eleven weeks of 1933, as against a rate of 12.5 for the corresponding period of last year.

Southern California Medical Association.—The tentative program of the annual meeting of the Southern California Medical Association in Pasadena, April 7-8, is as follows:

Dr. Emil Bogen, Olive View, Cause of Death in Consumptives.
Dr. Norman J. Kilbourne, Los Angeles, Internal Hemorrhoids: Comparable Results of Treatment by Operative and Injection Methods: A Survey of 60,000 Cases.
Dr. Markley C. Cameron, Jr., Los Angeles, Functional Dyspepsia.
Dr. Earl M. Tarr, Los Angeles, Relation of Vitamin B Deficiency to Metabolic Disturbances During Pregnancy and Lactation.
Dr. George D. Brown, Pomona, Treatment of Acute Intestinal Obstruction.
Dr. Samuel M. Alter, Los Angeles, The Acid-Base Equilibrium.
Dr. George S. Sharp, Pasadena, Curability of Cancer by the Combined Methods of Irradiation and Surgery.
Dr. Neville T. Ussher, Santa Barbara, Treatment of Bronchial Asthma with Physiotherapy.
Dr. Carl R. Howson, Los Angeles, Cavities in Pulmonary Tuberculosis: Their Significance, Prognosis and Treatment.
Dr. Howard L. Updegraff, Los Angeles, Reconstruction of the Burned Face.

A symposium on thermotherapy will be given by Drs. Douglas R. Drury, Los Angeles, John F. Van Paing, Santa Barbara, and James Ross Moore, Los Angeles. The Friday evening session will be addressed by Drs. Jacob C. Geiger, health officer of San Francisco, on "Treatment of Carbon Monoxide Poisoning," and Arthur W. Meyer, professor of anatomy, Stanford University School of Medicine, San Francisco, on "Attrition in the Human Body."

COLORADO

Venereal Disease Clinic.—With the discontinuance of the clinic for the treatment of venereal diseases operated by the state board of health, because of a reduction in funds, the Denver health department opened its own clinic, March 15. Five rooms have been made available on the third floor of the Police Building, it was stated, where indigent residents will be treated. Social service aid will be used to prevent the use of the clinic by persons who should obtain treatment from private physicians.

ILLINOIS

Warning About Rabid Dogs.—The state department of health, Springfield, issued a warning, March 14, concerning dogs suffering from rabies. Three persons have died of the disease in the state recently, it was stated. Fifty of 100 dogs recently examined were found to be suffering from rabies.

Past Presidents Honored.—The Kane County Medical Society, Dundee, presented badges of honor to all living past

presidents of the society at a meeting, February 15. Dr. George J. Schneider, Elgin, who served in 1903, is the oldest living past president. Others are Drs. Frederick C. Schurmeier, Elgin, who held office in 1912; William H. Bishop, Elgin, 1913; William H. Schwingel, Aurora, 1915; Adam E. Diller, Aurora, 1917, 1918 and 1919; Lawrence J. Hughes, Elgin, 1920; George W. Haan, Aurora, 1921; Ralph W. Carpenter, Geneva, 1925; Carl P. Struve, South Elgin, 1927; John W. Dreyer, Aurora, 1928, and Hugh H. West, Elgin, 1931. Dr. Frank E. Simpson, Chicago, addressed the meeting on "Radium Treatment of Cancer."

Quack Collins Electrocuted.—G. Ward Collins of Springfield was reported to have been electrocuted while operating an x-ray machine in his office, March 10. According to the Department of Registration and Education of the State of Illinois, Collins has been an old violator in the chiropractic field. When the clean-up was made in the department of registration and education and Mr. J. E. Edwards, the present chief inspector, was put on the job that he has so well filled, Collins' activities were looked into, and in January, 1931, a warrant was issued. The case was set for May, 1931, and was continued seven times. Finally the state got the case to trial, and on Sept. 29, 1932, G. Ward Collins was found guilty on two counts. A motion for a new trial was denied and a sentence of $500 was imposed and he was given sixty days to file a bill of exception. March 9, the state's attorney at Springfield was preparing an answer to Collins' brief, which was going to the appellate court.

Chicago

Northwestern Presents Program.—Northwestern University Medical School will sponsor the program of the Chicago Medical Society, April 12. Members of the faculty will speak as follows:

Dr. Fremont A. Chandler, Fractures of the Lower End of the Radius.
Dr. William R. Cubbins, Unilateral Fractures of the Tuberosity of the Tibia: Diagnosis, Differential Diagnosis and Treatment.
Dr. Paul B. Magnuson, Necessity of Early Differentiation Between Operative and Nonoperative Methods of Treatment in Fractures.
Dr. Harry E. Mock, Compression Fracture of the Spine.

The society's meeting, April 19, will be devoted to a clinical demonstration of dermatologic cases by the departments of dermatology of the medical schools of Rush, Northwestern, Illinois and Loyola.

"Cancer Specialist" Tilton Sentenced to Penitentiary.—Lester Tilton, "cancer specialist," was sentenced to serve from one to five years in the penitentiary and fined $2,000, February 6, in the criminal branch of the superior court for conspiracy to violate the Illinois medical practice act. Tilton's activities in the medical field have been carried on for years. At one time, he conducted an "institute" in Clinton, Iowa, where he is alleged to have treated cancer, tuberculosis and syphilis. Later his "clinic" in Detroit was closed (THE JOURNAL, Aug. 23, 1930, p. 601). In Chicago, Tilton's quackery was particularly blatant. Harry de Joannis, one of Tilton's business agents, received a similar sentence and fine. Sentence has not yet been imposed on Dr. Joseph Duffy, whose license to practice medicine has been revoked on account of his association with Tilton. At the recent hearing, attorneys for Tilton and de Joannis were granted sixty days in which to prepare a bill of exceptions for an appeal. Tilton's exploitation of his so-called cancer cure was described in THE JOURNAL, June 7, 1930, page 1858, and July 2, 1932, page 38. The former article has been reprinted and will be sent to any one who encloses a 3 cent stamp with the request. The three defendants were found guilty of conspiracy to violate the medical practice act, June 16, 1932. It has been pointed out that all physicians associated with Tilton in his quack enterprise have had their licenses either revoked or suspended according to the degree of their connection.

IOWA

Society News.—Dr. Joseph Brown, Des Moines, will address the Linn County Medical Society, Cedar Rapids, April 13, on "Menstrual Disorders"; this will be an exchange program with the Polk County Medical Society.——At the annual meeting of the Sioux Valley Eye and Ear Academy in Sioux City, January 24, Drs. Eugene C. Foote, Hastings, Neb., spoke on "Personal Experiences on Cataract Work in India"; Abbott M. Dean, Council Bluffs, "Care of Glaucoma"; Augustus G. Pohlman, dean, University of South Dakota School of Medicine, Vermilion, "Unreal Phenomena and Their Relations to Auditory Tests"; Clarence E. Robbins, Pierre, S. D., "Thrombophlebitis of the Lateral Sinus," and Joseph J. Hompes, Lincoln, Neb., "Notes on Oriental and Spanish Eye Clinics" with motion pictures.——Dr. Abraham R. Hollender, Chicago, addressed a joint meeting of the Marshall County Medical Society and the Sixth Councilor District Medical Society, March 7, at Marshalltown, on otolaryngologic problems of the general practitioner.——Dr. Sidney A. Slater, Worthington, Minn., was elected president of the Sioux Valley Medical Society at the recent annual meeting in Sioux City, and Dr. William Roscoe Jepson, Sioux City, secretary.——Dr. Harold Swanberg, Quincy, Ill., will address the Hardin County Medical Society at El Dora, April 5, on "Radium Therapy in General Practice."

MARYLAND

Bills Introduced.—H. 497 proposes to make the insanity of either spouse a cause for divorce. H. 413 proposes to authorize the state board of health to license and regulate the operation of hospitals. Hospitals are to be licensed annually and must pay annual fees of $50.

Sir Henry Dale to Give Dohme Lectures.—Sir Henry H. Dale, director of the National Institute for Medical Research, London, England, will deliver the Dohme Lectures at the Johns Hopkins University School of Medicine, April 20-22.

MICHIGAN

Hospital News.—Dr. William J. Seymour, Detroit, member of the Welfare Commission, was honored recently when the commission voted to name the new seventy bed unit for mental patients at the Eloise Hospital, Eloise, after him, in appreciation of many years of gratuitous service.——A series of graduate clinics began at the Herman Kiefer Hospital, February 15. They will be held weekly until April 19.

Personal.—Dr. Edwin R. Vander Slice has been appointed director of the Lansing health department, effective May 1. For several years Dr. Vander Slice was director of the Michigan Tuberculosis Association. He has also served as president of the Michigan Trudeau Society and of the Mississippi Valley Sanatorium Association.——Dr. Wilkie L. Howard, Detroit, has been appointed medical director of the American Legion Hospital, Battle Creek, succeeding the late Dr. Clifford L. Welbourne.——Dr. Fannie Elizabeth Barrett has resigned as school medical inspector of Kalamazoo, after fifteen years' service. She is succeeded by Dr. Kenneth L. Crawford.

Third Graduate Course.—The Michigan State Medical Society and the department of postgraduate medicine, University of Michigan, will cooperate in a graduate course in diseases of the heart and circulatory system, April 3-7. Participating in the course will be Drs. Frank N. Wilson, Paul S. Barker, David Murray Cowie, Fred J. Hodges, Franklin D. Johnston, Carl V. Weller, all of Ann Arbor, and Edward D. Spalding, Robert L. Novy, Hugo A. Freund and Norman E. Clarke, all of Detroit. The course, March 27-31, dealt with diseases of metabolism and that for March 20-24 with pulmonary tuberculosis. Courses will also be held in ophthalmology and otolaryngology, April 24-29, at the university; in proctology, May 15-27, and gynecology, obstetrics and gynecologic pathology, June 19-July 1, at the Receiving Hospital, Detroit. The fifth annual practitioners' course will be conducted, June 19-July 1. Complete details may be obtained from the department of postgraduate medicine, University of Michigan Medical School, Ann Arbor.

MINNESOTA

Bills Introduced.—H. 1529 proposes to prohibit the use, sale, transportation or possession of peyote. H. 1580, to amend the workmen's compensation act, proposes, in effect, to make compensable any disease or infection arising out of any employment covered by the act. H. 1581, to amend the workmen's compensation act, proposes to add carbon monoxide poisoning to the list of compensable occupational diseases.

"Electropath" Sentenced.—Victor J. Zettel, St. Paul, pleaded guilty before Judge O'Brien of the district court, March 3, to practicing healing without a basic science certificate and was given a six months sentence in the St. Paul workhouse; the sentence was suspended for one year. Zettel has no license to practice healing in any form in Minnesota. He was arrested following his "treatment" of a man for varicose veins and ulcers. The judge ordered Zettel to close his office immediately.

Society News.—A cardiovascular clinic was conducted before the Hennepin County Medical Society, Minneapolis, March 29, by Drs. Jay C. Davis, Reuben A. Johnson, Arthur C. Kerkhof, Chauncey A. McKinlay and Thomas Ziskin.——The Minnesota Radiological Society heard the following

speakers at its meeting in Minneapolis, February 18, among others: Drs. Charles G. Sutherland, Rochester, "Atypical Findings in Bone Lesions"; Lester G. Ericksen, Minneapolis, "Preoperative Diagnosis of Malignancy of the Liver with Thorotrast," and Richard E. Scammon, Ph.D., "Contributions of Radiology to the Study of Growth."——Dr. Melvin S. Henderson, Rochester, spoke on "Fractures of the Ankle Joint" before the Mower County Medical Society in Austin, recently. ——A joint meeting of the Minneapolis District Dental Society and the Hennepin County Medical Society, March 6, was addressed by Clayton Swason, D.D.S., and Dr. Carl W. Waldron on "Dental Caries" and "Fractures of the Jaws and Facial Bones," respectively.

MONTANA

New Officers of State Board of Health.—Dr. Byron L. Pampel, Livingston, was recently elected president of the Montana State Board of Health; Drs. George M. Jennings, Missoula, vice president, and William F. Cogswell, Helena, secretary.

NEBRASKA

Cancer Conference at Creighton.—Drs. Joseph C. Bloodgood and Charles Geschickter, Baltimore, will conduct a three-day cancer conference at Creighton Memorial, St. Joseph's Hospital, Omaha, April 19-21, under the auspices of Creighton University School of Medicine. On the first day the morning will be given over to consideration of new growths of the oral cavity and the afternoon to bone tumors; the second day to tumors of the breast, uterus and ovaries, and the third day to cancer of the skin, lymph glands, chest, and the urinary and gastro-intestinal tracts. At an evening meeting, April 19, Dr. Geschickter will speak on "Bone Dystrophies," and Dr. Bloodgood, the following evening, on "What Every Physician Should Know About Cancer." All physicians and dentists interested in malignant conditions are invited to attend and to bring their microscopes. They may also bring any borderline or early cases for presentation and discussion. No fee will be charged. To register for the meeting or for further information address Dr. James F. Kelly, Creighton Memorial, St. Joseph's Hospital, Omaha.

NEW JERSEY

Bills Introduced.—A. 374 proposes to prohibit the sale or distribution of barbital or of any other hypnotic or somnifacient drug except on the prescription of a licensed physician, dentist, or veterinarian. A. 401 proposes to accord physicians treating persons injured through the fault of other persons liens on all rights of action, claims, judgments, compromises or settlements accruing to the injured persons because of their injuries.

Society News.—Drs. Aaron E. Parsonnet, Newark, and Le Roy W. Black, Rutherford, addressed the Bergen County Medical Society, Hackensack, March 14, on "Failing Heart of Middle Life" and "Coronary Disease," respectively.—— Dr. Arthur L. Stone, health officer of Camden, was elected president of the New Jersey Health Officers' Association in February.—— Dr. Leon T. Ashcraft, Philadelphia, was the speaker before the Gloucester County Medical Society, Woodbury, February 16, on "Urology as It Interests the General Practitioner."

NEW YORK

Physicians' Hobbies.—Rochester physicians held an exhibit of their leisure-time handiwork, including paintings, wood carvings, ship models, violins, photographs and various kinds of collections, at the Rochester Academy of Medicine, March 2-3. Drs. Joseph B. Loder and Homer A. Harvey, Batavia, exhibited violins they had made; Dr. George W. Corner has constructed a home-made telescope and Drs. Cyril Sumner, Clarence P. Thomas and Joseph R. Mayer displayed ship models, the Rochester *Times-Union* reports. Artists included Drs. John R. Williams, John F. Gipner, Henry B. Crawford, Istvan Gasper, George B. Carroll and Robert B. Kennedy. Among the collectors are Drs. Williams, who showed pictures of Washington and Lincoln; Sumner, tropical and oriental fish; Alvah C. Remington, pistols; Mayer, old armor; Nathaniel W. Faxon, old coins; Eldred W. Kennedy, stamps; William Douglas Ward, ancient clocks; George W. Goler, old furniture; Grace A. B. Carter, medicinal plants; George W. O'Grady, autochrome plates. Workers in wood and metal include Drs. Edward Parnall, Stearns S. Bullen and Morris E. Missal. Numerous photographers were represented in the exhibit, including Drs. Albert C. Snell, Graydon Long, James K. Quigley, Raymond W. Hawkins and Charles B. F. Gibbs.

New York City

Sixth Harvey Lecture.—Michael Heidelberger, Ph.D., associate professor of biological chemistry, Columbia University College of Physicians and Surgeons, delivered the sixth Harvey Lecture of the year at the New York Academy of Medicine, March 16.

New Hospital at Medical Center.—The Institute of Ophthalmology of the Columbia University Medical Center, begun in 1931, was opened for patients in January. The new hospital, said to be the only one in New York devoted exclusively to treatment of diseases of the eye, is at Fort Washington Avenue and One Hundred and Sixty-Fifth Street. The building is nine stories high, with a capacity of eighty-six beds. The institute will have a staff of fifteen physicians, six interns and thirty nurses, under the direction of Dr. John M. Wheeler, professor of ophthalmology, Columbia University College of Physicians and Surgeons, and head of the ophthalmologic service at Presbyterian Hospital. Margaret H. McCurdie, R.N., is superintendent of the hospital.

Admission to Dispensaries.—A committee representing hospital superintendents and the special committee on hospitals and dispensaries of the Medical Society of the County of New York recently established a schedule of eligibility for admission to dispensaries. It was agreed that a single person without dependents who earns $900 or less per year should be admitted. For a family of two the annual income limit was fixed at $1,400, and $250 was added for each dependent in larger families. The total family income is to be considered in families in which parents and children are working. It was decided also that an acute illness for which the medical expenditure would not exceed $25 should be considered a case for private care when the earnings exceeded the schedule adopted. The examining physician in the clinic would decide whether the illness is acute or chronic and whether it could be treated for $25. The patient would then be referred to a social worker for decision on the ability to pay.

OHIO

State Medical Meeting Postponed.—The eighty-seventh annual session of the Ohio State Medical Association, which was to have been held in Akron in May, has been postponed till October.

Bill Enacted.—S. 9 has become a law, amending the state prohibition law so as to permit physicians to prescribe alcoholic liquors under the same general restrictions that are imposed by the Volstead Act and regulations promulgated thereunder.

Society News.—Dr. Charles A. Doan, Columbus, addressed the Summit County Medical Society, Akron, March 7, on "Newer Immunological Concepts in the Control of Communicable Diseases."——Dr. George T. Pack, New York, addressed the Columbus Academy of Medicine, February 20, on carcinoma of the stomach, and also students of Ohio State University College of Medicine, on "Physics and Biophysics of Radium." Dr. Willard C. Stoner, Cleveland, spoke, February 27, on "Chronic Arthritis and the Rheumatic State."

OREGON

Bills Enacted.—S. 127 has become a law, prohibiting the dispensing of drugs to the public by means of automatic vending machines. H. 127 has become a law, requiring all applicants for licenses to practice medicine, osteopathy, chiropractic, naturopathy or any other system of the healing art, as a condition precedent to examination by their respective "professional" boards, to be examined in anatomy, physiology, pathology, chemistry and hygiene by a state board of higher education.

PENNSYLVANIA

Personal.—Dr. Frederick H. Allen, Philadelphia, has been elected chairman of the eastern section of the Pennsylvania Mental Hygiene Committee for 1933.—— Dr. John Bruce McCreary, Harrisburg, was elected president of the American Association of School Physicians at the fifth annual session in Washington, D. C.

Bills Introduced.—S. 629 proposes to prohibit hospitals receiving financial aid from the state or from any political subdivision thereof from employing any alien who does not furnish proof from the federal government that he entered the United States lawfully. H. 1485, to amend the workmen's compensation act, proposes, in effect, to make compensable any occupational disease contracted in the course of any employment covered by the act.

Society News. — Dr. Hugh H. Young, Baltimore, will address the Pittsburgh Urological Association, April 10, on prostatic obstruction.——A symposium on disease of the suprarenal glands was presented before the Lackawanna County Medical Society, Scranton, March 7, by Drs. Maximilian A. Goldzieher, Maurice Packard and Harry F. Wechsler, all of New York.——Dr. Thomas G. Simonton, Pittsburgh, addressed the Cambria County Medical Society, Johnstown, March 9, on visceroptosis.

Philadelphia

Newbold Lecture.—Dr. Burton J. Lee, New York City, delivered the twenty-ninth Mary Scott Newbold Lecture of the Philadelphia College of Physicians, March 23, on "Cancer —A Community Health Problem."

Diphtheria Campaign.—The Philadelphia County Medical Society has announced its annual diphtheria immunization campaign during April and May. For the convenience of physicians, toxin-antitoxin is to be supplied from distributing points in various parts of the city. The department of health will refer to private physicians all patients who come to the health centers and are able to pay. Special instruction in the technic will be given at the headquarters of the society, April 6-7 and April 13-14.

Scarlet Fever Epidemic in 1932.—Philadelphia had the most extensive epidemic of scarlet fever ever recorded in its history during 1932, with 6,549 cases and 48 deaths. The only year since 1900 which approaches the record of last year was 1921, when 6,432 cases occurred, with 104 deaths. Statistics show that scarlet fever has been definitely on the increase since 1919, as there have not been fewer than 2,000 cases since that year. The nearest approach was in 1923, when there were 2,233 cases, with 34 deaths. Whooping cough was second in prevalence, with 5,351 cases in which 57 patients died. Chickenpox was third, with 3,846 cases. The incidence of measles was reported to be unusually low: 408 cases, with 1 death. The city had only 17 deaths from diphtheria, the lowest number recorded in its history. The health department received reports of 23,777 deaths, a rate of 12.01 per thousand of population.

RHODE ISLAND

Bills Introduced. — H. 837 proposes, in effect, that all applicants for licenses to practice medicine, osteopathy or chiropractic be first examined by the public health commission in anatomy, physiology, chemistry, bacteriology, pathology, public health and symptomatology and diagnosis before being examined by their respective examining boards. H. 860 proposes that all applicants for licenses to practice medicine, osteopathy, chiropractic, dentistry or podiatry pass examinations in anatomy, physiology, pathology, symptomatology and diagnosis, chemistry, bacteriology and public health, to be given by a board of examiners in the basic sciences before being permitted to present themselves for examination to their "professional" examining boards. No member of the board of examiners in the basic sciences is to be a member of the public health commission or of the various professional examining boards.

TENNESSEE

Bill Introduced.—S. 342 proposes to authorize the governor to appoint a public health council, which shall formulate the policies of the department of public health and shall nominate the commissioner of public health for appointment by the governor.

Society News.—Dr. Francis R. Fraser, London, England, addressed the Nashville Academy of Medicine, February 14, on "Generalized Osteitis Fibrosa and Hyperparathyroidism." Dr. Worcester A. Bryan addressed the academy, March 14, on cholecystectomy. —— Drs. Robert B. Wood, Knoxville, and Spencer B. McClary, Etowah, addressed the McMinn County Medical Society, Athens, February 9, on "Home Management of Diabetes" and "Management of Influenza," respectively.—— The Fentress County Medical Society entertained the Five-County Medical Society (Putnam, White, Overton, Cumberland and Jackson counties) in Jamestown, March 1; speakers were Drs. A. H. Crouch, Forbus, on pelvic inflammation; John T. Moore, Algood, importance of medical organizations, and William C. Officer, Monterey, pneumothorax. —— Drs. William H. Reed, Kingsport, and Aaron Cole, Piney Flats, addressed the Sullivan-Johnson Counties Medical Society, in Kingsport, March 1, on appendicitis.——Dr. Henry C. Long, Knoxville, addressed the Knox County Medical Society, February 28, on "Functional Digestive Disturbances." —— Dr. Thomas L. Bowman, Harriman, addressed the Roane County Medical Society, February 21, on acute prostatitis.

TEXAS

University News.—Dr. Henry Reid Robinson, associate professor of obstetrics and gynecology, has been named professor of clinical obstetrics and gynecology at the Medical Department, University of Texas, Galveston. Members of the Texas senate were guests of the school, February 11, when Dr. Edward H. Cary, Dallas, President, American Medical Association, addressed the legislators on the cost of medical care.

Bills Introduced.—H. 829 proposes that physicians, in the absence of express contracts to the contrary, may not recover in court actions for their fees more than indicated below: office consultation, $1; house call, $2, and traveling expenses not to exceed 25 cents per mile; major operation, $100; minor operation, $10; visit while in hospital, 50 cents. S. 459, to amend the medical practice act, proposes that the act shall not be construed to apply to a member of any church who treats human ailments by prayer or spiritual means, as an exercise or enjoyment of religious freedom, if he does not prescribe or administer drugs or medicines, or assume the title of "Dr.," or hold himself out to be a physician. Such a person, however, is not to be exempt from the quarantine and sanitary laws of the state.

VIRGINIA

Hospital News. — The seventh annual spring graduate course offered by the Gill Memorial Eye, Ear and Throat Hospital, Roanoke, has been postponed for this year because of economic conditions.——The third annual graduate clinic for Negro physicians will be held at St. Philip Hospital, Richmond, June 19-July 1. Physicians from other states will be admitted this year.

McGuire Lectures.—The program of the Stuart McGuire Lectures for 1933, to be given April 25-27 at the Medical College of Virginia, Richmond, will be devoted to the cardiovascular system. Dr. Ronald T. Grant, University College Hospital Medical School, London, will give three lectures on "Pathology of Endocarditis" and one on "Arteriovenous Anastomoses in Human Skin," and Dr. Tinsley R. Harrison, Nashville, Tenn., will lecture on cardiac dyspnea. Dr. Louis Hamman, Baltimore, will hold a clinicopathologic conference and Dr. Paul D. White, Boston, a cardiac clinic.

WISCONSIN

Bills Introduced.—S. 282 proposes to make it unlawful for any person to experiment or operate in any manner on any living dog, for any purpose other than the healing or curing of that dog. A. 672 proposes to prohibit the possession, use and sale or other distribution of any contraceptive drug or device or the dissemination of birth control information. The bill, however, is not to apply to licensed physicians who, in their opinion, find it necessary to prescribe methods to prevent communication of disease.

GENERAL

Alcohol Salesman Is Impostor.—A man using the name Robert H. Downs is reported to be taking orders from physicians and dentists for alcohol under the fraudulent representation that he is a salesman for the U. S. Industrial Alcohol Corporation, Frankford Distilleries and Italian Swiss Colony Wineries. He carries business cards and order forms on which the names of these firms are misspelled and which bear a prohibition permit number that does not exist. He takes an order from a doctor or dentist, collects cash and disappears. According to the report, Downs started his solicitation in Nebraska and has appeared in Iowa, Minnesota and South Dakota. He was last heard of in Idaho. It is believed that he is working toward Seattle.

Pharmacists Opposed to Handling Beverage Liquors. —The council of the American Pharmaceutical Association, in view of suggestions that malt liquors be distributed through drug stores, adopted a resolution protesting against any legislation permitting or requiring such distribution. The resolution points out that pharmacists are now charged with the distribution of alcoholic liquors for medicinal purposes and that public welfare and public health require that it be kept entirely separate from the distribution of such liquors as beverages. It further declares that the distribution of alcoholic malt beverages in drug stores would be inappropriate "because it would be contrary to the essential purpose and important responsibilities of pharmacy in relation to the people and to public health and because, through such distribution,

an activity foreign to its purposes and ethics would be introduced."

Society News.—Dr. Peter Whitman Rowland, Oxford, Miss., was named president-elect of the Mid-South Post-Graduate Medical Assembly at the annual meeting in Memphis, Tenn., February 16. Dr. Alexander B. Dancy, Jackson, Tenn., was installed as president and Drs. Henry King Wade, Hot Springs, Ark., Augustus Street, Vicksburg, Miss., and Frank J. Runyan, Clarksville, Tenn., were elected vice presidents. Dr. Arthur F. Cooper, Memphis, was reelected secretary.——Officers were elected at the annual meeting of the Pacific Coast Surgical Association in Del Monte, Calif., February 23-25, as follows: Drs. Ernst A. Sommer, Portland, Ore., president; Thomas M. Joyce, Portland, and Sumner Everingham, Oakland, Calif., vice presidents, and Edgar L. Gilcreest, San Francisco, secretary. The 1934 meeting will be held in Portland the last week-end in February.——Dr. William T. Pride, Memphis, was elected president of the Southern Interurban Gynecological and Obstetrical Society at its third annual meeting in Memphis, February 13. Among speakers on the program were Drs. Henry Schmitz, Chicago, on "Economic and Technical Problems in Radiation Therapy"; Joseph L. Baer, Chicago, "The Third Stage of Labor," and Jennings C. Litzenberg, Minneapolis. Dr. Percy H. Wood, Memphis, is secretary.

Medical Bills in Congress.—*Changes in Status:* S. 562 and H. R. 1718, relating to the prescribing of medicinal liquor, have been ordered favorably reported by the Senate and House Committees on the Judiciary, respectively. *Bills Introduced:* S. 193, introduced by Senator Capper, Kansas, proposes to amend the laws of the District of Columbia relating to degree-conferring institutions, so as to permit institutions heretofore incorporated under such laws, and operating exclusively in a foreign country, to use the words "Federal," "American," etc., in their titles. S. 759, introduced by Senator Shipstead, Minnesota, proposes to authorize the Reconstruction Finance Corporation to make loans, in the aggregate amount of not to exceed $25,000,000, to any public or private hospital organized under the laws of any state. S. 783, introduced by Senator Copeland, New York, proposes to prohibit the counterfeiting of any medicine or preparation recognized in the United States Pharmacopeia or National Formulary for internal or external use, and any substance or mixture of substances intended to be used for the cure, mitigation or prevention of diseases of either man or animals. H. R. 3829, introduced by Representative Henney, Wisconsin, and H. R. 3902, introduced by Representative Mitchell, Tennessee, propose to regulate the importation of milk and cream, and milk and cream products, into the United States. H. R. 4135, introduced by Representative McSwain, South Carolina, proposes to authorize the acquisition of additional land for the use of the Walter Reed General Hospital.

Bequests and Donations.—The following bequests and donations have recently been announced:

New York Post-Graduate Medical School and Hospital, $5,600 as a gift from Mrs. Henry S. Rea, to establish the Oliver Rea Scholarship Fund and for research in bacteriology in the department of pathology.

St. Luke's and Children's Homeopathic Hospitals, Philadelphia, $10,000; Grenfell Association of America for St. Anthony's Hospital; American Mission to Lepers, New York, and Pennsylvania Institution for the Instruction of the Blind, Philadelphia, $5,000 each, by the will of the late Florence Ludwig.

Hospital for Joint Diseases, Beth Israel Hospital, Mount Sinai Hospital, Lebanon Hospital Association, St. Vincent's Hospital, Montefiore Hospital for Chronic Diseases, Bronx and Jewish Maternity hospitals, New York, and Northwoods Sanatorium, Saranac Lake, N. Y., were among twenty-six institutions which received contingent bequests of $1,000 each by the will of the late Emanuel Gattle.

Temple University Hospital is to receive the bulk of an estate estimated at $235,000 under the will of Mrs. Etta Mellier, New Haven, Conn.

Hamot Hospital, Erie, Pa., $67,000 by the will of Harry L. Moore.

Marion County (Ind.) Tuberculosis Association, Indianapolis, $3,500 by the will of Leander S. Burdick, to build a hospital for mothers and children.

Laconia Hospital, Laconia, N. H., $5,000 by the will of Rev. Willis R. Odell, Sandown.

The town of Carrollton, Ill., $150,000 by the will of Mrs. Clarence Kelsey, Chicago, to build a hospital.

Elliot Community Hospital, Keene, N. H., $3,000 by the will of the late Mrs. Emily J. E. Daland.

Gates Hospital for Crippled Children, Elyria, Ohio, $160,000 by the will of Miss Sarah Flickinger.

Mansfield (Ohio) General Hospital, $10,000 for the building fund under the will of L. R. Dronberger.

Chester County Hospital, West Chester, Pa., $20,000 by the will of William P. Sharpless.

King's Daughters' Hospital, Madison, Ind., $10,000 in the will of Mary Elizabeth Heberhart.

Winona General Hospital, Winona, Minn., will receive the bulk of the estate of the late John Dietze, valued at about $200,000.

Childrens' Mercy Hospital, Kansas City, Mo., about $25,000 by the will of Mrs. Emma W. Robinson.

Presbyterian Hospital, Chicago, $25,000 from the estate of the late John Brackett Lord.

New England Hospital for Women and Children, Boston, $15,000 by the late Hannah H. Kimball.

Vassar Brothers Hospital, Poughkeepsie, N. Y., $25,000 by the late Johnston L. Redmond.

Philadelphia Freemasons' Memorial Hospital, Elizabethtown, $10,000 by the late Charles K. Channon.

PHILIPPINE ISLANDS

Medical Election.—At the annual meeting of the Philippine Islands Medical Association in December, 1932, the following officers were elected: Drs. Antonio C. Villarama, Manila, president; Sixto A. Francisco, Los Banos, Laguna, and Marcelino Asuzano, Pasig, Rizal, vice presidents, and Antonio S. Fernando, Manila, secretary-treasurer.

FOREIGN

Medals Awarded.—Prof. Edward Mellanby of the University of Sheffield, England, has been awarded a medal of the Royal Society of London for his work on dietary factors, especially in rickets. Dr. C. E. Correns, director of the Kaiser Wilhelm Institute for Biology, Berlin-Dahlem, will receive the Darwin medal for research on genetics, and Dr. Torwald Madsen, director of the State Serum Institute, Copenhagen, will receive the Buchanan medal for work on immunity, especially in relation to diphtheria antitoxin.

Honorary Degrees.—The Faculty of Medicine of Lyons, France, at a ceremonial, Nov. 3, 1932, conferred the degree of doctor honoris causa on Prof. Emil von Grosz, professor of clinical ophthalmology and formerly dean in the Royal Hungarian University of Budapest Faculty of Medicine; Baron Sandor Koranyi, professor of medicine in the same university; Prof. Edvard Ehlers, physician-in-chief to the community hospital of Copenhagen, Denmark, and Professor Jean Verhoogen of the University of Brussels, president of the permanent committee of the International Association of Surgery.

Cerebrospinal Fever in Cairo.—An epidemic of cerebrospinal fever in Cairo, Egypt, during 1932, is described in the *Journal of the Egyptian Medical Association.* In the epidemic, which reached its peak, March 4, there was an aggregate of 980 cases, in which 422 patients died, making a case mortality rate of 42.3 per cent. During the preceding year 413 cases were reported with 246 deaths, giving a case mortality rate of 59.6 per cent. Cairo has not been totally free from the disease since 1909, although there had been a downward trend from 1916 until 1929. The epidemic of 1931-1932 reached its peak five weeks earlier than that of 1930-1931.

A New Medical Journal.—A new review for the medical profession of the Mediterranean countries and the "Middle East," entitled *Folia Medica Orientalia,* has recently been established in Jerusalem. The publication is to appear in sections, each devoted to a specialty. The *Folia Ophthalmologica Orientalia* and *Folia Oto-Laryngologica Orientalia* have already appeared and the *Folia Medicinae Internae Orientalia* is to be printed shortly. Departments of surgery, dermatology and pediatrics are to be added within the year. At present it is published in English, French and German and it is expected that articles in Italian and Spanish will be accepted later. Dr. Aryeh Feigenbaum, Jerusalem, is responsible editor of the group and editor of the ophthalmologic journal.

Government Services

Dr. Sayers Returns to Public Health Service

Dr. Royd R. Sayers of the U. S. Public Health Service, who has been assigned to the U. S. Bureau of Mines for the past sixteen years, has been transferred back to the service to take charge of the division of industrial hygiene and sanitation. Dr. Albert Eugene Russell will succeed Dr. Sayers.

Dr. Rossiter Appointed Surgeon General of Navy

Dr. Perceval Sherer Rossiter has been appointed surgeon general and chief of the Bureau of Medicine and Surgery of the U. S. Navy, with the rank of rear admiral, for a term of four years. The Senate confirmed the appointment, March 16. At the time of his selection, Surgeon General Rossiter was commandant of the Naval Hospital in Washington. He is a graduate of the University of Maryland School of Medicine, Baltimore, class of 1895. Surgeon General Rossiter, who is 58 years of age, was appointed an assistant surgeon in the navy in 1903, and, in 1924, was commissioned a captain of the medical corps.

Foreign Letters

LONDON

(From Our Regular Correspondent)

March 4, 1933.

Another Phase of "Social Reform"

Attention has recently been called in THE JOURNAL (March 4, p. 673) to the extraordinarily wide meaning given by the courts to the term "accident" in the workmen's compensation act. A man died from angina pectoris while cleaning out metal dross from a pot, and in spite of argument to the contrary the judge held that he had suffered a personal injury by "accident" which accelerated his death, thus entitling his family to compensation. An appeal was made to higher courts, which upheld this judgment. Though the personal injury could not have happened but for disease of the coronary arteries, the combination of disease and employment made it "a personal injury by accident." The *Lancet* has reviewed some previous similar legal decisions. In 1910 the leading advocate of the day, Sir John Simon, now foreign secretary, tried in vain to persuade the judges that injury by disease cannot be injury by accident. He was dealing with the case of a workman who suffered from an aneurysm in such an advanced stage that it might have burst during sleep. He was only tightening a nut with a spanner, an operation requiring no special strain, but the aneurysm burst and he died. The house of lords (the highest court) decided that this was an accident arising out of his employment. Lord Macnaghten in giving judgment explained the reasons as follows: An aneurysm is an unnatural or abnormal dilatation of an artery; still it is part of the artery and so part of the man's body. The man "broke part of his body. . . . The fact that his condition predisposed him to such an accident seems to me to be immaterial; the work was ordinary work but it was too heavy for him. The fact that the result would have been contemplated as certain by a medical man if he had diagnosed the case is nothing to the purpose." In another case a workman ruptured himself in turning a wheel and the house of lords unanimously held that it was personal injury by accident. In a further case the judges stated that employers must pay compensation for internal injuries occurring in the course of workmen's employment no matter what his state of health. The *Lancet* concludes that "the case where a man carries about with him a fatal disease becomes a serious industrial problem." Would more frequent and systematic examination help to solve it? It could do so only by refusal to employ any one suffering from or even suspected to be suffering from any serious disease. Thus many men quite capable of suitable work would be prevented from earning a living. This would be a burden on the state and ultimately on industry. But one of the evils of democracy is that this consideration is disregarded, though such disregard in the pursuit of so-called social reform is largely responsible for our present industrial plight.

The Transmission of Yellow Fever over Continents

The possibility that increased facilities for traveling by train and air might lead to yellow fever being carried from West to East Africa and ultimately across Asia was put forward as a great danger at a meeting of the advisory committee of the Ross Institute for Tropical Diseases. Mr. John Still of the Ceylon Association in London said that the death rate in the outbreak of yellow fever in Rio de Janeiro in 1929 was 59 per cent. Airplanes had rendered it possible to cross Africa within the period of incubation. The question also arose whether infected mosquitoes might not be carried by airplanes. The mosquito remained infected as long as three months. Experiments had shown that mosquitoes released in ordinary postal airplanes traveled 1,250 miles and survived three stops in airdromes where the crews were changed and baggage and passengers transferred. Twenty-two per cent of the test mosquitoes came through alive. It was known that thirteen species carried yellow fever and that monkeys, mice and other animals could be infected. Since the principal yellow fever mosquito was abundant all over the tropics, including East Africa and tropical Asia, the possibility of the disease being transferred by airplanes suddenly became of importance to the world. The permanent committee of the Office international d'hygiène publique, whose delegates represent fifty governments, has been engaged since 1929, in cooperation with the International Commission for Air Navigation in reviewing the risk of transmission of infectious diseases by aircraft. The result is the International Sanitary Convention of 1932, which regulates quarantine measures. None of its provisions have received more careful study from every angle than those relating to yellow fever. They are based on the recommendations of an expert commission of representatives of the British, French and Belgian possessions in Africa, of British India and of the American countries interested in the problem. At present no lines of air traffic have been established between the West Africa regions where yellow fever is endemic and other parts of Africa where the disease is unknown. The members of the International Sanitary Convention for Aerial Navigation unanimously agreed that in countries where yellow fever may exist they should not await the appearance of recognizable cases but take steps to search for unrecognizable ones by biologic methods and that measures for preventing spread by aerial traffic should be taken at the port of those areas where the disease exists.

PARIS

(From Our Regular Correspondent)

Feb. 15, 1933.

The Cost of Medical Education

The number of students enrolled in the French facultés de médecine continues to increase, far beyond the needs of the population, leaving out of the count the foreign students who are supposed to return to their native countries, although it appears that many of them remain in France. The number of new physicians entering medical practice, each year, greatly exceeds the number of deaths and retirements. The income of the physicians, except for the eminent practitioners located in the large centers, is modest indeed. In vain have the medical syndicates endeavored to induce the directors of the lycées and the colleges to use their influence with the parents of pupils who are graduated from these schools to direct their attention away from the profession of medicine, by emphasizing the disappointment that is in store for most of the younger physicians. With this in view, a journal published recently the cost of a medical education up to the time when a physician may count on acquiring a paying practice. The items include the cost of schooling, beginning with the first class in the lycée, and comprise the first five years of practice, years in which the profits from the profession do not cover the cost of living. The total is placed at 116,385 francs (about $4,650). In this figure, the cost of enrolment and of the examinations amounts to nearly 4,000 francs ($160). To this sum must be added the cost of a student's living for five or six years. These figures represent only the minimum of expenses absolutely required. If the future physician aspires to a position a little out of the ordinary, he must prepare for the competitive examination leading up to the post of hospital intern and chef de clinique, and then hospital physician. In that case, the duration of the studies is tripled, and the cost of living, without immediate financial profit, is greatly extended. The poor student, who cannot count on his family sending him an ade-

quate monthly check, is compelled to perform humble tasks outside his study hours, in order to eke out his slender income. Some students drive taxicabs at night or serve as ushers in theaters and motion picture houses.

Tuberculosis in Algeria

A great effort is to be made to reduce the spread of tuberculosis among the natives of Algeria. Prof. Léon Bernard, vice president of the Comité national de défense contre la tuberculose, has been sent to Algeria by the ministry of public health, charged with the organization of a new program of action in collaboration with the governor general. The consulting commission on tuberculosis, created last summer at Algiers, has already studied various prophylactic measures and the organization of hospitals. The campaign against tuberculosis presents great difficulties in Algeria, owing to the low standards of hygiene among the natives. The campaign that is to be undertaken, for which the appropriations are generous, is designed to check the progress of tuberculosis. A large number of the natives of Algeria were called to France, after the war, to supplement the lack of man power caused by the loss of a million and a half men, most of whom were farmers and workmen. These Algerian immigrants, mostly, were or became addicted to alcoholism, living in squalor and easily contracting tuberculosis in the factories. On returning to their country, where they were not so welcome owing to the unemployment among workmen, they brought tuberculosis into their native regions. Now, however, the public health service of Algeria has become active. The following figures give an idea of the extent of this movement: In 1920 the expenditures in this field amounted to about $800,000; today they have risen to nearly $5,000,000. The number of hospital beds has increased, in ten years, from 3,600 up to 6,900 beds for patients, and from 750 up to 2,150 beds for aged persons. The number of hospitalizations in 1910 was 35,000; in 1920, 42,000, and at present the number exceeds 70,000. The disappearance of epidemics, the diminution of the mortality, and the increase of the population (50,000 a year) prove that this effort is beginning to show results.

BERLIN

(From Our Regular Correspondent)

Feb. 13, 1933.

Roentgen Sound Film

The Hochschule für Musik has a radio experimental station in which Heinz Grosse has produced a film in which he synchronized roentgen pictures with corresponding sound records. One sees, for example, the diaphragm and heart of an athlete working in rhythmic agreement. The eye and the ear follow the motions and sounds associated with articulated words. Even when a person is silent, the sounds of his heart will be caught by the transmitter and will furnish an accompaniment to the roentgen pictures showing the pumping activity of the heart. Since heretofore heart sounds and murmurs have been reproduced without distortion by the method of Dr. Jacobsohn, he has been endeavoring to make records suitable for instruction purposes, and secondly, to reproduce the heart sounds and heart murmurs synchronously with the heart movements. From a number of single roentgen negatives, systole and diastole are selected and positives are prepared from them; the transitional movements between the two phases are represented artificially. Thus one procures a roentgen film of heart action; by taking into account the time factors affecting heart action and the speed with which the film pictures are presented, one can figure out the number of "frames" required for the various phases. For the preparation of the individual frames, Jacobsohn constructed a camera that represents a combination of photographic apparatus and cinema camera. The sound films that were first prepared and presented (a normal heart and a heart with aortic insufficiency, which in the roentgenogram shows a projecting left ventricle and aortic arch) were synchronized with the artificial heart sounds. These artificial sounds, which Jacobsohn presented a year ago before the Berliner Medizinische Gesellschaft, are especially suitable for a sound film because of their freedom from disturbing factors in connection with high amplification (THE JOURNAL, April 2, 1932, p. 1199).

For the purpose of synchronization, Jacobsohn uses an electrical cardiac tachometer, which has a device gaged according to the frequency of the heart beat and connected with the heart sound generator. In this manner the number of sounds or murmurs produced when the film is reeled off at a given speed is determined and thus a synchronism between the pictures and the sounds is produced. The didactic value of the new method is based on the simultaneous optical and acoustic record of the heart action under normal and pathologic conditions.

Voluntary Sterilization

As times change, opinions change, and that applies also to medicine. In a recent letter (THE JOURNAL, Aug. 27, 1932, p. 774) mention was made of a legal action in which the question of sterilization was involved. But now the medical syndical organizations of Germany—the Deutscher Aerztevereinsbund in association with the Hartmannbund—have petitioned the federal ministry of the interior to draft, at the earliest possible moment, a federal law permitting and regulating sterilization on eugenic grounds. Sterilization would of course always be contingent on the consent of the patient or his legal representative. The medical profession of Germany expressed itself as opposed to compulsory sterilization.

The subject of eugenics and sterilization is to be discussed at length at the next Deutscher Aerztetag (1933), after the preliminary work has been done.

According to existing laws, eugenic sterilization is punishable as unauthorized bodily injury. At first, an endeavor was made to have a paragraph inserted in the penal code that would provide for exceptions to the law. What is now desired is not an exception to the law but that special legislation be enacted that will legalize, for the public welfare, what has heretofore been prohibited.

Sterilization would be permitted only with the consent of the person concerned or the legal guardian, and then only in case a commission appointed by the chief authorities in each *land* shall give its approval. This commission would consist of a judge and two physicians, one of whom should be familiar with the "laws" affecting hereditary transmission in man. The decision of the commission would include the reasons for consenting to or refusing the sterilization. The written decision would be transmitted to the petitioner and a copy would be filed with a specially designated registrar. The physician who undertakes such an operation would also file with the registrar a short statement setting forth his reasons for the operation. Only a physician licensed to practice in Germany would be permitted to perform sterilization. The commission would impose no fees on the person to be sterilized. In the case of indigent persons, costs of the operation would be met by the welfare department. All persons having knowledge of the operation would be pledged to secrecy.

For eugenic sterilization, the persons to be considered are: those suffering from hereditary mental disease, mental weakness, epilepsy or any other hereditary disease, or who have morbid hereditary predispositions, if, according to the teachings of medical science, severe bodily or mental hereditary taints are extremely likely to develop in their offspring. The legislation will not consider the social indications for sterilization, as was feared by many, nor will it deal with the medical indications, which have to do with warding off a menace to life. Sterilization on the basis of recognized medical indica-

tions is permitted by the present penal code. The bill that is being proposed has to do with the welfare of the human race, whereas the social and the medical indications concern the welfare of individuals.

Humanity as a whole suffers constantly from the fact that the procreation of persons with sound hereditary characters is not sufficient to preserve its own numbers, whereas families with severe hereditary taints are propagated without check. It is difficult to restrict the propagation of persons with unsound hereditary characters. Such restriction is absolutely necessary for economic reasons; for the number of persons with serious hereditary taints, who become criminals or a burden to the public, is increasing. A diminishing number of persons capable of earning a living has to provide for an increasing number of economic incompetents. More than $25,000,000 annually, and probably twice that sum, if everything is considered, is needed for institutional and welfare care of incompetents, whereas persons of sound body and mind suffer in large numbers for the lack of necessaries of life. The prevention of propagation among incompetents by permanent segregation in institutions is economically impossible, so that no other way is left than the elimination of their procreative power.

Heart Disease in Railway Engineers

Professor Munk of Berlin has written an article in *Soziale Medizin* on the incidence of heart disease in railway engineers, in whom it appears justified to consider heart disease as an occupational disease. He points out that 36 per cent of the deaths among railway engine crews are due to heart disease, compared with 16 per cent among the male population over 20 years of age. The average age attained by members of engine crews is 50-55 years, which is below normal. Nearly 20 per cent of the men die before reaching the highest post that the service offers. Especially striking is the great frequency of sudden death due to heart attacks in the nature of angina pectoris or coronary sclerosis. The chief factors that play a part are the constantly fixed attention of the railway engineer during his run, his great sense of responsibility and moments of intense fear, the irregular hours of the service, lack of physical exercise resulting frequently in obesity and constipation, and working under intense heat (58 C., or 136.4 F., at height of head).

BELGIUM

(From Our Regular Correspondent)

Feb. 2, 1933.

The International League Against Quackery

The Ligue internationale contre le charlatanisme, simultaneously with the Ligue belge contre le charlatanisme, held a meeting during the Brussels medical week.

Dr. Brandlight, after welcoming the foreign delegates, spoke on the value of an international organization to combat quackery. The campaign should be directed on an international scale by a committee acting in collaboration with the organization and the League of Nations. Dr. Joly, the French delegate, pointed out the danger of entrusting to masseurs and to nurses slight medical interventions, as it leads the way to abuses. Furthermore, by encouraging in this way the illegal practice of medicine, the physician himself becomes a violator of the law.

After a discussion in which Mr. Lint of Netherlands, the president of the league, and Mr. Devis (a lawyer) took part, the assembly decided to confine the crusade to the countries in which laws, customs and the conception of charlatanry are essentially the same; that is, the countries of Europe.

It was decided to publish a periodical, which will be sent to the heads of the organizations in the various countries that are members of the International Committee. In this periodical will be reported all the judicial decisions secured against charlatans, so that it will have value as a reference work for jurists. The assembly renewed then for the year 1932-1933 the instructions as to the duties of the International Committee. Each country participating in the movement will pay dues amounting to $20.

The topic for the next meeting, to be held at Brussels in 1933, will be "The Definition in the Various Countries of the Term Charlatanry."

Fractures of the Calcaneum

At a special session of the Société belge de médecine et de chirurgie du travail, Professor Lenormant delivered a lecture on fractures of the calcaneum. The two groups of these fractures depending on the manner in which they are produced are (1) fractures due to tearing of the achilles tendon, and (2) fractures due to crushing, by far the more numerous. The gravity of these fractures depends on the extent to which the compact upper articular surface is driven into the spongy substance of the bone. Lenormant divides these fractures into three groups, the first not being susceptible to surgical treatment; the two others justify surgical intervention.

Lenormant emphasized the importance of the structure of the calcaneum, which consists of spongy bone reinforced by three kinds of trabeculae: the posterior, extending downward and anteroposteriorly; the anterior, extending in the reverse direction, and the third group combining the two others. Between these trabeculae, the spongy tissue is soft and friable. In fractures due to crushing, the thalamus, or the compact articular surface, is driven into the cavity below, between the bony trabeculae. The extent to which the upper articular surface is driven in is indicated by the angle of the tuberosity (Böhler). The crushing of the thalamus causes a deviation of the articular surface of the astragalus, which is forced downward and backward.

Professor Lenormant took up the treatment of these fractures. For many years a let alone policy was usually pursued, but the results were poor. Surgical treatment then began to be considered. The first operation resorted to was astragalocalcanean arthrodesis (Van Stockum). Other surgeons performed astragalectomy (Leriche and Tanton). Leriche keeps the articular surface in place with the aid of the metal devices of osteosynthesis (Dujarier's clasps or Lambotte's treatment).

The method of Lenormant and Wilmoth consists in reducing the fracture by careful removal of the fragments and by keeping the thalamus in place with the aid of bone grafts taken at first from the external malleolus and later from the internal aspect of the tibia. The foot is immobilized by means of sacks of sand and then, after the skin sutures have been removed, it is put in a plaster cast. The cavity below the thalamus is obliterated by these grafts. The results shown by Lenormant were remarkable. The calcaneum is well reconstructed. The articular deviation is minimal. Certain cases, however, present ankylosis of the calcaneo-astragaloid and the calcaneocuboid articulations, without functional impairment. The grafts are well tolerated. After a few years, they are totally absorbed and their presence can no longer be detected in roentgenograms. The functional results are good.

Death of Professor Henrijean

The death of Professor Henrijean, professor of pharmacology and therapeutics in the Société de médecine de Liége, is announced. Since 1905, he had been a corresponding member of the Royal Academy of Medicine of Belgium. He published reports on numerous experimental researches in pharmacodynamics. In recent years, he devoted himself to a comprehensive study of the electrical manifestations of the energy of the myocardium.

MOSCOW

(From Our Regular Correspondent)

Jan. 30, 1933.

Congress of Surgeons of the Soviet Union

The twenty-second congress of surgeons of the Soviet Union was held in Moscow in May, 1932. About 1,800 members and guests were present. The topics on the program were (1) endemic goiter in the Union of Socialist Soviet Republics, (2) treatment of patients after operations on the gastro-intestinal tract, (3) measures for combating industrial trauma, (4) the problem of surgical cadres, and (5) blood transfusion.

Prof. V. S. Levite compiled a geographic map showing the increase in endemic goiter in the Soviet Union. In order to combat it, prophylactic measures must be taken, sanitary and hygienic conditions improved, and small doses of iodine used.

The care of patients after operations on the gastro-intestinal tract was discussed by V. M. Vosnesensky, who divides it in two parts: (1) general treatment to regulate the function of all the organs and (2) special treatment for different systems and organs. The latter consists in feeding as early as possible and not forcing an early emptying of the bowels. It is well to take away bandages that restrict the respiratory movements. The co-author of this paper, M. A. Kimbarovsky, reported that among 3,000 patients who were allowed to get out of bed early the number of cases of embolism as well as the number of postoperative pneumonias decreased.

In the discussion, Zabludovsky and Hessin did not agree with Kimbarovsky. The organization of medical care for traumatic cases was discussed by Prof. V. Gorinevsky, who said that it is necessary to render aid at the place where the trauma is received. There must be transportation to carry patients to the local trauma station, where medical help can always be obtained. The trauma station of the local hospital is the next point of treatment. The introduction of socialistic labor, the reconstruction of factories, the seven-hour day and the six day week have decreased the number of cases of traumatism.

Percentage of Postoperative Pneumonias

	1927-1928 Before	1929-1931 After
Having patients leave bed at an early period:		
Operations on the stomach	12.5	2.34
Appendectomies	5.57	0.48

On the fourth day of the congress the question of anaerobic infection was discussed. Prof. N. N. Bourdenko read a paper based on his observation of 128 cases of gas gangrene and on 1,383 cases of other Russian authors. Serotherapy combined with surgery is the best treatment. Serum must be injected before gas infection develops. N. M. Velikanov said that gas gangrene is caused by four types of bacteria living in earth: Clostridium welchii is found in the wound in from 44 to 90 per cent of all cases. Clostridium oedematiens in from 15 to 50 per cent, Clostridium oedematis-maligni in from 10 to 30 per cent and Clostridium histoliticum in 6 per cent.

In 1929, Velikanov prepared an antigangrene serum that saved twenty-three patients among thirty-four who had gas gangrene.

The last day of the congress was devoted to the present status of the problem of blood transfusion. Prof. G. I. Spasocucotzky said that blood transfusion may be used in acute anemia, chronic anemia, infections, intoxications and constitutional diseases.

Dr. V. I. Braitzev of Moscow demonstrated his apparatus for collective transfusion and determination of blood groups.

The Leningrad surgical clinic reported 604 cases of blood transfusion. In 343 cases, the transfusion was made by the direct method. Only one patient died of hemolysis. The influence of hemolyzed and noncompatible blood is shown by a decrease of blood pressure and spasm of the renal vessels. The patient dies of uremia.

In the discussion, attention was called to the importance of a correct determination of the blood group as well as to the technic of transfusion. Prof. E. Hesse noted that the direct method gives six times fewer complications than the citrate method and spoke against the use of uremic and eclamptic blood for transfusions.

The next surgical congress of the Union of Socialist Soviet Republics will be held this year in Leningrad.

BUCHAREST

(From Our Regular Correspondent)

Feb. 23, 1933.

The Impoverished Hospitals

It is rare that one hears in the national assembly an echo of the complaints relating to the conditions under which patients languish in the hospitals. Physicians have repeatedly warned the government that the contractors threaten the hospitals with stopping supplies of drugs and food if they do not get their money, but in vain. These unbearable conditions were the subject of a speech in the national assembly by Hudita, who detailed the miserable health conditions in the county of Baia. Similar conditions prevail in several other districts. He said that in the hospitals of this county the nurses have not been paid for six months, while the officials and others have received no pay for nine months. The subsidies received during 1932 were insufficient and the hospitals are entirely impoverished. Nobody wants a contract with the hospitals, so there is no food and drugs at the disposal of the patients. Hudita appealed to the minister of health, Joanitescu, to remedy these conditions. Joanitescu found that the facts exposed by Hudita are true, but these hospitals belong to the jurisdiction of the county magistrates and he is unable to do anything. He saw on a tour of inspection that the patients had no dressing supplies at their disposal at a hospital in this county. He brought before the ministerial council the terrible conditions in the 64 state and 229 county hospitals. He demanded that 60 million lei be granted to him from the income on duties on spirits to improve conditions in the hospitals. He could get only 10 millions. He realizes that in some parts of the country hygienic conditions are the worst imaginable, but he hopes that from the revenue of the state lotteries the public health service will receive funds. Dr. Lupu complained of conditions in several provincial hospitals. In the country there is, so to speak, no public health service. In the whole country there are 300 hospitals maintained by the counties, but all these are situated in towns, and there are 1,620 regional dispensaries. The minister said that the mortality rate of children and the number of tuberculosis and syphilitic patients is deplorably high. The country has no more serious problems at present than the deplorable public health conditions.

Memorial to Physicians

On the initiation of Queen Marie, a committee was formed in 1919 to provide a fund for a statue to the memory of those physicians who died at the front. In the course of thirteen years, the committee raised, together with the interests, 3,456,901 lei (nearly $20,500). The dedication of the monument took place this month, in the presence of the king. The dedicatory speech was made by Professor Stefanescu of Galatz, vice president of the Rumanian Medical Association. The imposing statue was carved by Rafael Romanelli, the Italian sculptor. The principal figure of the monument is a woman, personifying Rumania, who is placing a wreath on the head of a physician attending a wounded soldier. The monument has been erected in the vicinity of the faculty of medicine, on the Boulevard Independentei, in which district almost all streets are named after prominent physicians.

RIO DE JANEIRO

(From Our Regular Correspondent)

Feb. 1, 1933.

Congenital Absence of Left Adnexa

Dr. Azael Lobe reported before the Society of Medicine and Surgery of Campinas at São Paulo a case of congenital absence of the left adnexa. The patient was a woman, aged 29, mother of seven children, of whom five are living. She had always menstruated regularly. During the operation for suspension of the uterus by means of the round ligaments, the author noted the absence of the left ovary and tube. The uterus was normal, as were the round and broad ligaments. There was no trace of the left ovary, and the tube was represented by a small protuberance at the uterine cornu. In such cases the homolateral kidney, as a rule, is absent. In his case he found later, on cystoscopy, that the urine issued normally from the two ureteral openings, which shows the presence of the left kidney. Reports of cases of this kind are rare.

Research on Anatomy of the Phrenic Nerve

Dr. Renato Locchi has made a systematic study on a series of white, Negro and half-breed cadavers in order to determine whether there are racial differences in the number and the location of the phrenic nerve and of the so-called accessory phrenic nerves. He has dissected 100 phrenic nerves. He concludes that (1) the third cervical root contributes more to the phrenic nerve in the Negro and the half-breed (50 per cent) than in the white, the so-called cranial migration of the phrenic nerve appearing to be more accentuated in their case; (2) in the material examined, the accessory phrenic nerves were frequent (71 per cent) and came in 52 per cent of the cases from the nerve to the subclavian muscle.

Lesions in Exanthematous Typhus

Dr. Moacyr Amorim described previously the lesions he found in a necropsy in a case of typhus which, as in most cases, consisted of a hemorrhagic disturbance with septic infarcts of various viscera. He found in the cerebellum a few granulomatous nodules similar to those described by Popoff and Fraenkel; he also found the lesion described by Spielmeyer, which consisted of arborescent hyperplasia of the microglia, especially in the molecular layer. He says that the coexistence of these lesions with the usual lesions in other viscera is characteristic of the pathology of this disease. His communication was illustrated with projections of microscopic slides.

The Alkali Reserve in São Paulo

Dr. Dutra de Oliveira has studied with the method of Van Slyke and Cullen the alkali reserve of the plasma in persons living in tropical climates. He estimated with the apparatus of Bailley the amount of carbon dioxide and of oxygen in the alveolar air. He found that the average alkali reserve of males is 57.8 per cent in São Paulo and 54.9 per cent in Rio de Janeiro, and of females 50.3 per cent in Rio de Janeiro and 53.5 per cent in São Paulo. These data do not agree with those obtained by Sundstroem in Australia, where the average was 64 per cent. In São Paulo the amount of alveolar carbon dioxide was 5.02 per cent, and of oxygen 14.7 per cent. On this point there is some relation with the average of Sundstroem, which was 5.12 per cent for males and 5.24 for females.

Postvaccinal Encephalitis

Dr. Joaquim Pennino presented before his colleagues two cases of postvaccinal myelo-encephalitis. He compared the location and the nature of the lesions with those due to encephalitis. In giving the probable causes, he mentioned the following factors: (1) myelinic immaturity of the nervous system before the age of 3 years; (2) instability of the endocrine neurovegetative nervous system, making of the child in the first year of its life a megalosplanchnic biotype of low immunity; (3) retardation, at times hardly apparent, of maturity of the nervous fibers; (4) neuropathic stigmas. These factors allow the vaccine virus to attack the central nervous system. The author advises the following rules for vaccination: (1) examination of the neuromuscular system, especially with regard to maturity; (2) production of not more than one pustule before the age of 3 years; (3) scarification as superficially as possible; (4) abstention from vaccination during the summer, whenever possible, because in this season the immunity of the child is low.

Perforation of the Stomach in Blastomycosis

Drs. Lourival Santos and Floriano de Almeida state that blastomycosis in São Paulo is generally produced by Paracoccidioides brasiliensis. They cite a case of blastomycosis with perforation of the stomach due to a suppurating lymph node which produced necrosis of the serous and muscular tunics and subsequent perforation of the mucosa.

BUDAPEST

(From Our Regular Correspondent)

Feb. 24, 1933.

Experiments on Diabetes with Diathermy of the Pancreas

After long experimentation, Prof. Alexander Korányi and Dr. Zoltán Rausch succeeded in reducing the blood sugar in healthy subjects and also in diabetic patients by means of diathermy of the pancreas. The degree of reduction is slight as yet but is nevertheless encouraging. In cases of mild diabetes, the systematic use of diathermy of the pancreas with sittings of half an hour to an hour before the principal meals improved carbohydrate tolerance. In rather severe cases of diabetes, diathermy of the pancreas had not the slightest result, so that Professor Korányi refrained from repeating the experiments on such patients. Under the action of diathermy, the insulin production of the pancreas could be increased and, hand in hand with this, the glycolytic power of the blood, Korányi and Rausch concluded that, if there exists a sufficient quantity of interstitial cells, diathermy of the pancreas is likely to act favorably on diabetes and on all its symptoms, while if the reduction of the islands of Langerhans is of a great degree, caution must be observed, for there is the possibility of the exhaustion of the secretory function.

Pathetic Story of a University Professor

Dr. Imre Basch, late director of the St. Stephen Hospital in Budapest, became ill some months ago with pain in his chest and difficult breathing. His physician friends assured him that his condition was not grave. He felt that his friends concealed the truth, and he tried a pious fraud. He wrote to Professor Finsterer in Vienna that a patient of his would call on him, whom he suspected to have cancer. He called on the professor, giving a false name. Finsterer made a thorough examination and said that he would give instructions as to treatment to his attending physician, Professor Basch of Budapest. In this letter he reported that his patient had cancer of the lungs and in his opinion had about two months to live. Instead of counting the days, Basch recalled the case of the bookkeeper in "Grand Hotel," who, having been told that he would die shortly, cast away in his last months all that he had saved during his lifetime. Professor Basch acted similarly. The temperate bachelor who had devoted all his energy to the furthering of medical science, threw himself into the night life. Although he had never tasted champagne, he began to indulge in alcohol. He danced into the night on that thin rope which separated him from death, said his friend at the funeral. This revelry hastened his death, which occurred last week. Professor Basch was a prolific writer on dermatology and venerology. His treatises would form volumes, had he published them in book form. As a teacher at the university he was foremost, as proved by the great number of his pupils.

Marriages

BERNARD LAURISTON HARDIN, JR., Washington, D. C., to Miss Dorcas Fletcher Hull at Pittsfield, Mass., March 11.

HARRY BRYANT SMITH, Hartford, Conn., to Miss Isabel Frances Eveleth of Windsor, February 22.

CHARLES BERKOWITZ, Chicago, to Miss Mary Aberbom of Winnipeg, Manit., Canada, March 19.

FRANKLIN C. BEEKS to Miss Katherine Bannon, both of Portsmouth, Ohio, recently.

ERVIN B. WALLACE, Baltimore, to Miss Helen Haupert, recently.

Deaths

John Francis Herrick ⊕ Ottumwa, Iowa; Keokuk (Iowa) Medical College, 1891; member of the House of Delegates of the American Medical Association in 1931; past president of the Iowa State Medical Society; fellow of the American College of Surgeons; member of the Radiological Society of North America and the American College of Radiology; served during the World War; on the staffs of St. Joseph and Ottumwa hospitals; aged 68; died, February 23.

Douglas Hunt Stewart ⊕ New York; College of Physicians and Surgeons in the City of New York, Medical Department of Columbia College, 1882; fellow of the American College of Surgeons; member of the American Urological Association; for many years on the staff of the Knickerbocker Hospital; aged 72; died, March 15, of cerebral hemorrhage and arteriosclerosis.

Carl Otto Fischer, Brooklyn; Long Island College Hospital, Brooklyn, 1916; member of the Medical Society of the State of New York; fellow of the American College of Surgeons; served during the World War; attending obstetrician to the Wyckoff Heights Hospital and the Bushwick Hospital; aged 45; died suddenly, March 9, of pulmonary embolism.

William Thomas Gott, Crawfordsville, Ind.; Eclectic Medical Institute, Cincinnati, 1878; member of the Indiana State Medical Association; since 1897 member, past president and secretary of the Indiana Board of Medical Registration and Examination; on the staff of the Culver Hospital; aged 77; died, February 24, of cerebral hemorrhage.

Ralph Waldo Hissem ⊕ Wichita, Kan.; University of Kansas School of Medicine, Kansas City, 1911; member of the American Urological Association; fellow of the American College of Surgeons; served during the World War; urologist to the Wichita Hospital; aged 47; died, February 27, of injuries received in an automobile accident.

Harry French Hoyle ⊕ Newburgh, N. Y.; Jefferson Medical College of Philadelphia, 1915; member of the Associated Anesthetists of the United States and Canada; past president of the Orange County Medical Society; aged 51; on the staff of St. Luke's Hospital, where he died, February 28, of cerebral hemorrhage.

Elston Hunt Bergen, Princeton, N. J.; College of Physicians and Surgeons in the City of New York, Medical Department of Columbia College, New York, 1877; bank president; formerly member of the board of health; on the staff of the Princeton Hospital; aged 81; died, March 8, of bronchopneumonia.

Bernard F. Garnitz, Chicago; Loyola University School of Medicine, Chicago, 1921; member of the Illinois State Medical Society; aged 41; on the staff of the Evangelical Hospital, where he died, March 11, as the result of gunshot wounds inflicted by bandits, when he was lured by a false emergency call.

Julius Theodore Haller ⊕ Davenport, Iowa; Johns Hopkins University School of Medicine, Baltimore, 1905; fellow of the American College of Surgeons; on the staff of St. Luke's Hospital; aged 54; died, February 28, of burns received when his automobile caught fire after plunging into a ditch.

Harry Greensfelder, St. Louis; St. Louis University School of Medicine, 1903; member of the Missouri State Medical Association; veteran of the Spanish-American War; aged 54; died, February 26, in the Barnes Hospital, as the result of an injury received in a fall.

⊕ Indicates "Fellow" of the American Medical Association.

Charles Lawrence Bradshaw, Crownsville, Md.; Medical College of Virginia, Richmond, 1912; member of the Medical Society of Virginia; served during the World War; aged 44; on the staff of the Crownsville State Hospital, where he died, February 22, of erysipelas.

Richard Gerstell, Keyser, W. Va.; University of Maryland School of Medicine, Baltimore, 1873; bank president; aged 81; died, January 13, in the Memorial Hospital, Cumberland, Md., of arteriosclerosis, hypertrophy of the prostate and bronchopneumonia.

John Carlton Brown, Williamsport, Pa.; University of Buffalo School of Medicine, 1889; member of the Medical Society of the State of Pennsylvania; for many years on the staff of the Williamsport Hospital; aged 68; died, February 13; of heart disease.

Archibald Daven Galloway ⊕ Barron, Wis.; Bennett College of Eclectic Medicine and Surgery, Chicago, 1908; member of the state board of medical examiners; part owner of the Riverside Hospital; aged 47; died suddenly, February 23, of heart disease.

Charles Carrell Krusen, Woodbury, N. J.; Hahnemann Medical College and Hospital of Philadelphia, 1921; county coroner; on the staff of the Brewer Hospital; aged 38; died, February 27, in the Hahnemann Hospital, Philadelphia, of heart disease.

Charles Wesley Thompson, Meadville, Pa.; Medical Department of Western Reserve University, Cleveland, 1882; member of the Medical Society of the State of Pennsylvania; aged 74; died, Nov. 21, 1932, of carcinoma of the esophagus.

Michel Delphis Brochu, Quebec, Que., Canada; Laval University Faculty of Medicine, 1876; emeritus professor of medicine at his alma mater; formerly superintendent of the Beauport (Que.) Insane Asylum; aged 80; died, March 12.

George Edward Delaney, Galveston, Texas; University of Texas School of Medicine, Galveston, 1896; member of the State Medical Association of Texas; aged 58; died, February 20, in the John Sealy Hospital, of cerebral thrombosis.

John H. Rehberger, Baltimore; University of Maryland School of Medicine, Baltimore, 1873; member of the Medical and Chirurgical Faculty of Maryland; aged 82; died, January 22, of arteriosclerosis and chronic myocarditis.

Walter Fisher Carstens, New Iberia, La.; Medical Department of the Tulane University of Louisiana, New Orleans, 1901; health officer of New Iberia; aged 57; died, February 19, of cerebral hemorrhage.

Mary West Niles, Pasadena, Calif.; Woman's Medical College of the New York Infirmary for Women and Children, 1882; formerly a medical missionary; aged 79; died, February 4, of influenza and bronchopneumonia.

Mell Aycock ⊕ Atlanta, Ga.; Emory University School of Medicine, Atlanta, 1917; served during the World War; on the staff of St. Joseph's Infirmary; aged 39; died, February 25, of carcinoma of the liver.

Henry Muetze, St. Louis; Missouri Medical College, St. Louis, 1891; member of the Missouri State Medical Association; aged 69; died, January 25, in the Missouri Baptist Hospital, of cerebral hemorrhage.

Henry Joseph Keaney ⊕ Everett, Mass.; Baltimore Medical College, 1901; served during the World War; on the staff of the Whidden Memorial Hospital; aged 54; died suddenly, March 1, of angina pectoris.

Frederic W. Kuechler ⊕ Newton, Ill.; Medical College of Indiana, Indianapolis, 1893; formerly county coroner, member of the state legislature and bank president; aged 56; died, February 25, of uremia.

George F. Cocker ⊕ New Orleans; Medical Department of the Tulane University of Louisiana, New Orleans, 1898; aged 67; died, February 12, of cerebral hemorrhage, arteriosclerosis and nephritis.

Harry W. Subera, Sioux Falls, S. D.; College of Physicians and Surgeons, Keokuk, Iowa, 1884; member of the South Dakota State Medical Association; aged 85; died, January 28, of influenza.

Albert Herman Hundertmark, Los Angeles; Bennett Medical College, Chicago, 1913; member of the Illinois State Medical Society; served during the World War; aged 44; died, February 10.

George Howard Fay ⊕ Auburn, Calif.; Cooper Medical College, San Francisco, 1902; formerly secretary of the Placer County Medical Society; aged 68; died, February 24, of cerebral embolism.

Samuel A. V. Christiphine, Attapulgus, Ga.; Southern Medical College, Atlanta, 1898; member of the Medical Association of Georgia; aged 64; died suddenly, February 22, of heart disease.

William Stuart Grimes, East Detroit, Mich.; University of Buffalo School of Medicine, 1901; aged 62; died, February 24, in St. Joseph's Hospital, Mount Clemens, of gastric hemorrhage.

Edward Haynes Woodruff, San Diego, Calif.; McGill University Faculty of Medicine, Montreal, Que., Canada, 1890; aged 75; died, January 16, of chronic nephritis and heart disease.

Adam Rush King, Fort Worth, Texas; Hospital College of Medicine, Louisville, Ky., 1905; member of the State Medical Association of Texas; aged 55; died, February 14, of heart disease.

Gilbert Clement McMaster ⊕ Pittsburgh; Western Pennsylvania Medical College, Pittsburgh, 1903; served during the World War; aged 57; died, February 7, of coronary disease.

John Rollin Shultz ⊕ Charleston, W. Va.; Medical College of Virginia, Richmond, 1918; on the staff of the Mountain State Hospital; aged 42; died, February 6, in a local hospital.

Jay Wesley Hamilton, Jacksonville, Ill.; Missouri Medical College, St. Louis, 1880; on the staff of the Illinois State Hospital; aged 75; died, February 20, of lobar pneumonia.

James Edward O'Donohue, Floral Park, N. Y.; Long Island College Hospital, Brooklyn, 1885; aged 72; died, January 23, of chronic interstitial nephritis and uremia.

Seth Andrew Light ⊕ Lebanon, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1904; aged 58; died, February 10, of coronary thrombosis and nephritis.

Margaret M. Morris, Los Angeles; University of Southern California College of Medicine, Los Angeles, 1907; aged 62; died, January 12, of carcinoma of the stomach.

John Henry Riley, Adams, Mass.; University of Vermont College of Medicine, Burlington, 1885; aged 80; died, February 6, of hemorrhage of the cerebral artery.

William H. Oliver ⊕ Bryan, Texas; Medical Department of the Tulane University of Louisiana, New Orleans, 1890; aged 63; died, February 7, of heart disease.

George P. Rishel, Philadelphia; University of Pennsylvania School of Medicine, Philadelphia, 1883; aged 80; died, January 4, of carcinoma of the stomach.

Frederick Hutchison ⊕ Aldie, Va.; Washington University School of Medicine, Baltimore, 1876; aged 80; died, February 20, of cerebral hemorrhage.

Morris Winston Gibbs, Lynchburg, Va.; Medical College of Virginia, Richmond, 1912; aged 54; died, January 28, in Bellevue, of cerebral hemorrhage.

Joseph Pendleton Stovall, Sardis, Miss.; Memphis (Tenn.) Hospital Medical College, 1883; aged 76; died, February 15, of cerebral hemorrhage.

W. Worley Damron, Carbondale, Ill.; St. Louis College of Physicians and Surgeons, 1904; aged 53; was killed, Dec. 23, 1932, when struck by a train.

John Wesley Jennings, Mohawk, N. Y.; Albany (N. Y.) Medical College, 1896; aged 65; died, February 14, of bronchopneumonia and undulant fever.

Emily Irvine Smith, Windsor, Ont., Canada; University of Toronto Faculty of Medicine, 1890; aged 64; died, Dec. 20, 1932, of pneumonia.

Samuel E. Reynolds, Elizabethton, Tenn.; Eclectic Medical Institute, Cincinnati, 1891; aged 69; died, February 10, of cerebral hemorrhage.

Hugo Sittel Weusthoff, Cranford, N. J.; Miami Medical College, Cincinnati, 1880; aged 73; died, Dec. 30, 1932, of lobar pneumonia.

Edwin Webster Shearburn, Fairbury, Neb.; Chicago Homeopathic Medical College, 1902; aged 70; died suddenly, Dec. 11, 1932.

Frederick T. Foard, Hickory, N. C.; Louisville (Ky.) Medical College, 1886; aged 76; died, February 4, of cerebral hemorrhage.

Edward G. Stout, Earlville, N. Y.; Albany Medical College, 1896; aged 60; was found dead, February 15, of angina pectoris.

Wilhelm Becker, Milwaukee; Milwaukee Medical College, 1897; aged 62; died, February 17, of heart disease.

Gus H. Covington, Wadesboro, Ky. (licensed, Kentucky, 1893); aged 89; died, February 25, of pneumonia.

Correspondence

METHYLENE BLUE AND CYANIDE POISONING

To the Editor:—Attention has recently been drawn (Brooks, Matilda M.: *Am. J. Physiol.* **102:**145 [Oct.] 1932. Geiger, J. C.: THE JOURNAL, Dec. 3, 1932, p. 1944. Hanzlik, P. J., ibid., February 4, p. 357. Eddy, N. B.: *J. Pharmacol. & Exper. Therap.* **41:**449 [April] 1931. Hug, Enrique: *Compt. rend. Soc. de biol.* **111:**519, 1932) to the earlier observation (Sahlin, B.: *Skandinav. Arch. f. Physiol.* **47:**284, 1925) that the injection of methylene blue antagonizes the toxicity of hydrocyanic acid administered to animals and man. The explanation of this protective action of the dye is of interest from several points of view: its bearing on the mechanism of tissue respiration, the possibility that other more effective antidotal agents may be found, and the limit to which protection against hydrocyanic acid poisoning may be expected from the dye and similarly acting substances. The purpose of this communication is to point out a few facts which bear on these questions.

Sahlin, Eddy and Brooks have expressed the view that the dye acts in overcoming cyanide poisoning by providing a substitute for the normal cellular catalysts of respiration which are inactivated by cyanide. Although this is a natural inference, in view of the known effect of methylene blue in partially restoring the respiration of certain hydrocyanic acid poisoned tissue or cell suspensions in vitro, it can be easily shown that a quite different explanation is the correct one as regards the antidotal action of the dye toward hydrocyanic acid in intact animals. It is known that methylene blue both in vivo (Combemale, M.: *Compt. rend. Soc. de biol.* **43:**300, 1891) and in vitro (Wendel, W. B.: *Proc. Soc. Exper. Biol. & Med.* **27:**624 [April] 1930. Wendel, W. B., and Shaffer, P. A.: *J. Biol. Chem.* **87:**xx [June] 1930. Warburg, O.; Kubowitz, F., and Christian, W.: *Biochem. Ztschr.* **227:**245, 1930) catalytically converts hemoglobin into methemoglobin, and that methemoglobin forms with hydrocyanic acid an unusually stable compound, cyanmethemoglobin. So firm is this union that hydrocyanic acid is removed with difficulty if at all by a vacuum, and methemoglobin may be used as an effective reagent for absorbing hydrocyanic acid from exceedingly dilute solutions or gases. From these facts it would seem to follow that formation of methemoglobin by the injected methylene blue leads to fixation of hydrocyanic acid as cyanmethemoglobin within the blood cell, whether the hydrocyanic acid enters the blood stream by absorption from the lungs, the alimentary tract, or the tissues into which it might have penetrated before the dye has been injected. If this is the correct explanation, a like or better protection from hydrocyanic acid poisoning should be afforded by the injection of methemoglobin alone, or by other agents which form methemoglobin more rapidly.

Experiments that confirm these expectations are to be reported before the American Society of Biological Chemists at its April meeting. In the meantime a paper has just appeared by Hug (*Compt. rend. Soc. de biol.* **112:**511, 1933) in which the same facts are recorded and the same conclusions are drawn. It is therefore timely that the results that Hug and I have obtained be brought to the attention of those interested in hydrocyanic acid poisoning.

The reinjection (intravenously) into dogs of the cells from 20 cc. of blood per kilogram of body weight, the hemoglobin of which has been converted to methemoglobin (by amyl nitrite, the excess nitrite being removed) effectively protects the animals from the toxic effects of a lethal dose of hydrocyanic acid. Also, the same volume of methemoglobin cells when injected into animals approaching death from a lethal dose of hydrocyanic acid rapidly revives the animals.

Hug finds that sodium nitrite (which is well known to form methemoglobin) is much more effective than methylene blue in protecting from cyanide. And in his most recent paper he finds that pyrogallol, pyrocatecol and phenylhydrazine have a similar effect.

As the antidotal action depends on conversion of oxygen-carrying blood pigment (hemoglobin) into nonfunctional pigment (cyanmethemoglobin), it follows that the successful use of methylene blue, or any other substance which acts in a similar manner, is limited by the extent to which this transformation is compatible with life. Probably not more than one half to two thirds of the hemoglobin can be spared under such circumstances without leading to asphyxia from insufficient oxygen transport. Since the normal hemoglobin content of dogs or man is about 0.7 to 0.8 millimols (as oxygen capacity) per kilogram of body weight, four lethal doses of hydrocyanic acid (0.44 millimols per kilogram, according to Hug) would inactivate about 60 per cent of the total blood pigment. As a matter of fact, this is the maximum dose from which Hug finds nitrite to afford protection. Analysis of the available data on the case of cyanide poisoning in man that was successfully treated with methylene blue (Geiger) serves as a further illustration. The amount of cyanide (potassium cyanide) absorbed (1 Gm. less 0.05 Gm. removed from the stomach) probably inactivated hemoglobin equivalent to about 1.6 liters of blood, or perhaps one fourth to one third of the total. Such a loss of oxygen-carrying capacity need not be serious. The absorption, however, of 2 Gm. of potassium cyanide probably, and the absorption of 3 Gm. almost certainly, would have been fatal in spite of the administration of methylene blue.

It appears to follow from the foregoing considerations that a possible protective action of methylene blue against the effects of hydrocyanic acid on the *tissues* is not susceptible of demonstration with the intact animal, because the animal will die from loss of functional hemoglobin before there is a surplus of hydrocyanic acid present to inactivate the tissue catalysts.

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THE MATERNITY WARD OF THE GENERAL HOSPITAL

To the Editor:—As honest doctors we are our own severest critics. Dr. DeLee's recommendations are sound but temporarily impractical.

Here are some figures from Detroit, which no doubt are being duplicated all over the country. The maternal mortality from 1928 through 1932 was 6.5 per thousand live births. Contrary to European statistics, this includes deaths from criminal abortions. In 1929, 33 per cent of all deaths and 59 per cent of septic deaths were due to abortions. These cannot be laid at the door of the obstetrician. Correcting the records for this inclusion reduces the rate to about 4.5.

During this period there were 8,000 deliveries in Harper Hospital with a death rate of 2.9, and 10,500 births in Providence Hospital with a mortality of 3.7. The figures for this city at large include these cases.

Two other facts are noteworthy: 1. The most seriously ill patients are sent to the hospital and among them the death rate is high. 2. Hospital cases are subject to searching inquiry by the medical staff, and hence their statistics are ac rate. There is not such an accurate check up on the causes of death in home deliveries.

Providence Hospital caters to the general practitioner and receives many complicated cases. Harper Hospital is patronized more by the specialist and draws a more carefully selected class of patients. Both institutions have mortality rates well below that of the district. Both are general hospitals subject to the disadvantages claimed by Dr. DeLee.

Great movements have intangible reasons unexplainable by cold figures. Hospitalization of maternity cases is due to many factors, including (1) much better anesthesia and (2) correct surgical repair of lacerations.

Hospitals need not be "cesspools of infection." Puerperal sepsis (not including septic abortions), accounting as it does for only 25 per cent of all deaths in the Detroit area, is not as great a danger as one would gather from Dr. DeLee's article.

Add to his remedies: (1) better instructions in obstetrics both for undergraduates and for postgraduates; (2) elevation of the obstetric division of the hospital to a plane equal to that of medicine and surgery; (3) education of the public to the fact that having a baby merits as much thought as being operated on for appendicitis or gallstones.

HAROLD HENDERSON, M.D., Detroit

"ERADICATING BOVINE TUBERCULOSIS"

To the Editor:—THE JOURNAL of February 18 contains an editorial called "Eradicating Bovine Tuberculosis" which has some queer statements in it. What is meant by: "It has also been demonstrated that the usual form which tuberculosis of the bovine type takes in the human patient is the nontuberculous, especially bone and gland"?

Your writer has evidently not read correctly the classic article by Koch published in 1882. A few quotations from it will suffice: "It became evident that, just as the picture of the disease is the same, whether produced by all the enumerated different substances, so do the bacillary cultures obtained differ not in the slightest from one another." The sources of material enumerated by him in a preceding paragraph included tubercles from the lungs of apes, miliary tubercles from the brain and lungs of human beings, caseous materials from phthisical lungs, and nodules from the lungs and the peritoneum of cattle with perlsucht. ". . . so that the identicalness of the bacilli present in various tuberculous processes cannot be doubted" (Human lungs with miliary tuberculosis, human lung with caseous pneumonia, cavities, mesenteric nodes, pulmonary perlsucht in cattle). "Miliary tuberculosis, caseous pneumonia, caseous bronchitis, intestinal and lymph node tuberculosis, perlsucht in cattle, spontaneous and infectious tuberculosis in animals, must, according to my investigations, be declared identical" (translation of "Die Aetiologie der Tuberkulose," by Dr. and Mrs. Max Pinner, N. T. A., 1932).

Koch said that though he thought there might be some differences, he had been unable to detect them. Theobald Smith, in 1896 (not 1898, as given by your writer) first showed that there was a distinct difference between the human and the bovine organisms. His second paper appeared in 1898.

The first scientific proof that the bovine tubercle bacillus was dangerous to man was given from the Laboratory of the State Live Stock Sanitary Board of Pennsylvania, April 24, 1902. The work by Park and Krumwiede did not appear for some eight years after and was stimulated by Koch's second statement, made at a congress in this country, that the bovine tubercle bacillus did not cause pulmonary tuberculosis in human beings. Your writer has also apparently never heard of the work of the Royal Commission on Tuberculosis in England, or the Imperial Commission in Germany.

MAZYCK P. RAVENEL, M.D., Columbia, Mo.

COMMENT.—Dr. Ravenel's first criticism is of the statement: "It has also been demonstrated that the usual form which tuberculosis of the bovine type takes in the human patient is the nontuberculous, especially bone and gland." In this sentence nontuberculous should have read nonpulmonary, this being an error in copy which was not detected during revision.

The historical references relating to the development of our knowledge of tuberculosis are incidental to the main purpose of the editorial. It is, of course, correct that Koch's original work regarded the bovine and human forms as identical, but later he did hold that the germs were of different type and also that the bovine bacillus was incapable of infecting man. A statement to this effect was published in THE JOURNAL, Feb. 20, 1926, and was apparently not challenged at that time. In the historical references it was not deemed necessary to cite all the supporting evidence, such as the work of the Royal Commission on Tuberculosis, in England, or the Imperial Commission, in Germany.

While Dr. Ravenel's criticisms are correct, it does not appear that they affect the essential correctness of the facts presented in the editorial as a basis for the argument that bovine tuberculosis requires eradication.—ED.

THE FACTS ABOUT A REPRESENTATIVE SOUTHERN COUNTY

To the Editor:—Many years ago I heard a rather intelligent chap say that there are three degrees of untruths: lies, damned lies and statistics. This remark has been recalled a number of times lately, when reading matter relating to the Report of the Committee on the Costs of Medical Care, and expresses excellently my opinion of the whole proceedings.

It is extremely easy to collect a set of figures that can be interpreted in any way that any one of a dozen people wish to do. The committee (save the mark) has turned out a striking example.

An interesting illustration has just reached me: Surveys of the Medical Facilities in Three Representative Southern Counties, one being Lee County, Mississippi. This "representative" county, according to the information given in the survey, is "comparatively small" and its "per capita spendable money income" is 11 per cent plus less than the average for the state. How, then, can it be classed as representative?

It spends $11.14 per capita for medical care, and out of this it supports a thirty-five bed hospital and some thirty-eight rattling good doctors, many of whom I know personally.

For fourteen years it has had a full time health department, which now carries five full time employees. "Some of the smaller towns have local physicians who serve as health officers (without salary or specific duties)." In other words, they do what is needed without any higher-up specifying what they are to do.

The survey says: "The prevalence of malaria is a serious problem in the rural areas of this county." Its health officer says: "Within recent years numerous drainage problems . . . resulted in marked improvement of health conditions, especially in the prevention of malaria."

The survey says: "Cotton is the chief product . . . the money derived from the sale of cotton is received only once a year . . . consequently many . . . particularly of the tenant farmer class are virtually without cash income for the major part of the year." The health officer says: "Most every farmer owns high-bred Jersey cattle, many of which are registered, and the production of dairy products has increased very rapidly for the past few years. Milk and cream routes are established by or near most every farm in the county, and deliver these products at Tupelo. The growing of strawberries and truck farming is proving very valuable in some sections of the county."

With these errors as to conditions in the county it is not surprising that one finds other errors when it comes to a consideration of medical conditions.

The survey says: "In the absence of adequate personnel for all phases of health department work, school hygiene, immunization, and a general program of health education have been considered of greater immediate importance than maternal, infant, and preschool hygiene." The inference is that the latter have been neglected. The report of the health officer states that clinics are held in different communities throughout the county regularly each month and that midwives are required to bring their cases to the clinic for general examination. Wassermann tests are made, and urinalyses made regularly every two weeks. Home visits are made by the nurses. Preschool clinics have been held throughout the county for both white and Negro children during the summer and fall months of each year. The attendance in general has been good. The quotations from the county health officer are taken from his report to the state board of health and the legislature and cover a period of two years ended July 1, 1931.

All of which would go to show that the people of Lee County are not in such an awful fix after all, even if they do not spend per capita as much for medical care as the executive committee of the committee considers a safe minimum.

E. F. HOWARD, M.D., Vicksburg, Miss.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

URETHRITIS OF ALLERGIC ORIGIN

To the Editor:—In Queries and Minor Notes (THE JOURNAL, February 18) is a discussion of nongonorrheal urethritis. I have found a number of these cases to be due to food allergy, idiosyncrasy or whatever such reactions should be called. I have had three within the past year due to the drinking of tomato juice in excess, another from oranges and apples, and one from wheat bread and strawberries. One of the tomato patients tried it out on three separate occasions at intervals of two months and each time the discharge returned, to stop in a few days after discontinuance of the drink. He has never had gonorrhea. However, he gets urticaria and asthma from eating pork sausage. Most of the cases I have seen are in young men who state that they have not had gonorrhea. Certainly no gonococci can be found in the discharge, which consists mostly of mucus with a moderate amount of pus cells. The prostates are larger than normal and boggy at the time the discharge is present. I suspect many of the cases of long drawn out thin discharges following gonorrheal infection are due to this idiosyncrasy to food rather than to any residual inflammation. It will well repay investigating this angle of these cases. I always read the department of Queries and Minor Notes first. There is a lot of good stuff there for general practitioners.

M.D.

ANSWER.—Food allergy is a distinct cause of irritable bladder. Resistance is low in a patient suffering from intrinsic allergy. It is in line with good thought to believe that a slight catarrhal discharge with or without superimposed nongonorrheal infection could complicate chronic allergy.

It is important to remember that food allergy can give rise to mucous membrane edema, congestion, and mucous discharge and smooth muscle spasm in any part of the body, and that the bladder and urethra and even the ureters are not exempt. Perennial hay fever due to food sensitization producing nasal congestion, occlusion and mucoid discharge exemplifies such reactions in the nasal tissues. Mucous colitis is frequently due to food allergy, and recently leukorrhea has been described as one of the manifestations of uterine allergy. Bladder allergy was originally described by Duke and corroborated in a recent monograph on food allergy. The presence of eosinophilic leukocytes in the secretion would point toward allergy. The cystoscopic appearance of the bladder would be of interest, and such examinations should rule out definite pathologic changes. Hivelike swellings in the bladder mucosa have been seen. It may be mentioned that burning in the bladder and urethra often is extremely severe and persistent in bladder allergy, and spasms and pain in the urogenital tissues are frequently present. Excoriation of the vulval tissues extending to the adjacent skin has been reported, but similar lesions in the male tissues have not been recorded. In all problems of allergy especially those due to food, it is important to remember that many of the symptoms may be similar to those caused by infections and other disease types, though allergy may coexist with such conditions.

Thus this diagnosis of allergic urethritis is probably correct and should be kept in mind by physicians in handling urologic

problems. Allergy should be suspected especially in patients who have a personal or family history of hay fever, asthma, eczema, urticaria, angioneurotic edema, migraine or abdominal allergy. Histories of definite food dislikes or idiosyncrasies may or may not be elicited. Skin tests may indicate the causative foods but are frequently negative, especially in adults. Intradermal tests with active dependable sterile extracts are more valuable than are scratch tests. However, such reactions are often nonspecific and hard to interpret and their etiologic significance must be checked by actual food trial. "Elimination diets" modified by a history of food idiosyncrasies and skin reactions are of value in the determination of food allergies, particularly when diets based on reacting foods do not produce relief or when skin reactions are negative in a patient suspected of food allergy. The principles underlying these diets and the importance of absolute cooperation of the patient must be realized by physicians who use them.

SEBORRHEIC DERMATITIS, PSORIASIS OF SCALP OR PITYRIASIS RUBRA PILARIS

To the Editor:—A woman, aged 52, past the climacteric, well nourished, began to be troubled about three years ago with a disorder of the scalp. There has been no loss of hair. The lesions appear in isolated spots with a desquamation and under these scales they are hyperemic and dry. The scales are white and may be small or enlarged flakes. The condition appears on the anterior hair border or on the superior surface of the scalp. The patient is constantly annoyed by the desquamation. There is no particular itching. It will almost clear up at times and then comes back. I have tried many lotions and shampoos and oils. The one treatment that has seemed to do the most good is a strong exposure to ultraviolet rays. I will appreciate any suggestion in the way of diagnosis and treatment.

E. B. MINOR, M.D., Traverse City, Mich.

ANSWER.—Seborrheic dermatitis and psoriasis are the common diseases causing such involvement of the scalp. Pityriasis rubra pilaris may begin in the scalp but it begins usually at an earlier age, seldom remains so long confined to the scalp, and produces greasy scales, which mat together to form thick masses.

If this is seborrheic dermatitis, it is an unusual case because of the absence of itching or any tendency to loss of hair in three years, and the large dry flakes that form.

Psoriasis of the scalp may appear and persist for some time without appearing on the glabrous skin. It causes no itching or loss of hair and involves the frontal hair border as described. The patches are sharply circumscribed and tend to form heaped up scales if not constantly treated.

Either of these diseases might yield to ultraviolet rays but the readiness with which this case yields is unusual for psoriasis.

So long as this ready response to ultraviolet radiation continues, no other form of therapy can be suggested that is so clean and pleasant to use. After the scales have cleared up as a response to this treatment, a stimulating lotion such as

	Gm. or Cc.
Corrosive mercuric chloride	0.2 to 0.4
Resorcinol monoacetate	6.0
Castor oil	6.0
Spirit of formic acid	20.0
Compound spirit of myrcia	30.0
Alcohol	30.0
Distilled water to make	120.0

may be used, shaken and applied with a medicine dropper, then well rubbed into the scalp. Daily, vigorous brushing with a stiff bristle brush is recommended. The castor oil may be omitted if the hair does not need it and the corrosive mercuric chloride increased or decreased as judged best. Frequent use of a tar shampoo, for instance,

	Gm. or Cc.
Coal tar solution	3.6
Liniment of soft soap to make	120.0

may be recommended.

IMMUNIZATION AGAINST SCARLET FEVER

To the Editor:—Will you be kind enough to give me any information regarding E. R. Squibb and Son's product for scarlet fever immunization treatment? How long does this last? Are there any reactions? Is it safe to use on children of all ages? Are there any contraindications? Should they be tested before administration or after? Is it recommended by any state health department? Please give me any further facts that you may have. Please omit name.

M.D., Illinois.

ANSWER.—It has been found that active immunization with graduated doses of scarlet fever toxin, if carried to the point of an entirely negative skin test, may be expected to last for a period of at least four to five years in more than 90 per cent of the persons thus immunized. Statistics from groups retested at longer intervals are not yet available.

There are reactions during the course of active immunization. These reactions may consist of local redness and swellings, or in more highly susceptible persons there may be general reactions associated with fever, nausea and rash which usually disappear within forty-eight hours.

According to the information thus far available, it is safe to immunize children of all ages, including infants.

Exceptional individuals are sensitive to broth and in these individuals urticaria may develop within a few minutes after injection of any preparation containing broth, including scarlet fever toxin and diphtheria toxoid. The development of urticaria in such individuals may usually be prevented by injection of 0.2 cc. of a 1:1,000 solution of epinephrine hydrochloride taken up in the same syringe with the immunizing dose.

It is advisable to make tests for susceptibility to scarlet fever before immunizing against the disease, because many persons are spontaneously immune to the disease and do not require immunization. Retests should always be made after immunization.

Scarlet fever immunization is employed by a number of the state health departments, including Illinois, Michigan and Kentucky.

These answers are made on the assumption that the questions concern scarlet fever toxin for active immunization rather than scarlet fever antitoxin for temporary passive protection, and they apply to the E. R. Squibb & Sons product as well as to the other commercial products now on the market in the United States.

EFFECTS OF COLD QUARTZ ULTRAVIOLET RAY ON EYE

To the Editor:—Would it be possible for a patient to get permanent injury to the eyes, with the cold-ray ultraviolet one minute at 24 inches? The eyes were unprotected but did not look directly at the light all the time. There was some pain and burning four or five hours later, but the whole condition apparently cleared up within two or three days. Five weeks later the patient began complaining of weak eyes and one physician attributes this to the ultraviolet. Is it possible that the patient has received a permanent injury? Please omit name and address.

M.D., Kansas.

ANSWER.—There are two types of cold quartz ultraviolet generators: the orificial applicator and the grid type for body radiation. The correspondent was apparently using the latter type. About 94 per cent of this lamp's radiation of wavelengths less than and including 313 millimicrons is contained in the resonance emission line at 254 millimicrons.

Only visible rays, i. e., rays between 760 and 380 millimicrons, are capable of penetrating the crystalline lens, producing physiologic photochemical changes in certain cells of the retina.

Rays from 380 to 295 millimicrons are absorbed by the lens and cause it to fluoresce, which seems to act as a protection to the retina. If an eye in which the lens has been enucleated is irradiated with these rays, certain changes occur in the cells of the retina at once or in several hours, but they return to normal in a few days.

Radiation of a wavelength less than 295 millimicrons is absorbed by the cornea and conjunctiva.

The lamp mentioned by the correspondent gives 94 per cent of its radiation at the line of 254 millimicrons. This radiation, at the distance of 24 inches for one minute, could cause a conjunctivitis and a cloudiness of the cornea. There should have been an interval of a few hours before this occurred. These conditions disappear in a few days, and with this dose of ultraviolet radiation, no permanent injury should occur.

SALE OF SPECTACLES AT CHEAP RATES

To the Editor:—Here is a newspaper clipping from a Cleveland newspaper. According to this ad a person can get his eyes examined, for which I get from $5 to $10, together with a pair of glasses for $4.50. This is less than the wholesale price of the same glasses from the American Optical Company. Can you kindly tell me where they get these glasses? Are they any good? I am informed that one company in Cleveland does a $60,000 optical business a year. Certainly this cannot all be humbug. Another company in Akron does a $20,000 optical business a year. The result is that my refraction business is chimerical. Is it possible to buy glasses cheaper than those obtainable from the American Optical Company, etc.? It seems to me that something ought to be done, and I ask your cooperation in this matter.

FRED V. GAMMAGE, M.D., Akron, Ohio.

ANSWER.—Optical merchandising principles do not vary materially from the principles of merchandising of other goods, and in the optical trade there are first, second, third and ad infinitum qualities of goods exactly as there are in the cloak and suit business. A suit may be purchased from $10 to $100, depending on the quality of the material and the character of workmanship employed in production. Optical goods have a similar range in price, affected by the same factors, but unfortunately the public cannot differentiate between first quality and shoddy optical goods. Therefore the cut-rate optical houses, the chain store opticians, the blatant "low-price" houses, the optical

departments of the chain drug stores, and all the other concerns that examine eyes and furnish glasses at a ridiculously low price are merely foisting third rate goods on the public with the unspoken intimation that they are first rate.

The rather common advertisement of "Get your eyes examined and a pair of gold-filled rimmed bifocals" has a somewhat different basis. On the day of that advertised sale there are actually three or four pairs of such glasses dispensed, at a marked loss, of course, to the company. The rest of those who fall for the advertisement are told that the supply of the advertised glasses is exhausted and they are then subjected to high-pressure salesmanship for whatever the clerk thinks the customer is good for. The examination of the eyes is performed by a salaried and licensed optometrist, who spends just as little time as is necessary to impress the customer.

What is the remedy for this situation? The education of the public and the refusal of advertising mediums to accept advertisements of this type. But there is more to it than that. Of the ophthalmic lenses that are manufactured and sold in this country, it is estimated that about 20 per cent are purchased on prescriptions of ophthalmologists, about 20 per cent on prescriptions of recognized legitimate optometrists, about 40 per cent from chain store optical houses, drug stores and the like, and about 20 per cent are sold over the counter by "pick-them-out-yourself" methods. It is further estimated that more than seventy million ophthalmic lenses are sold each year; but no figures are available as to what percentage of these are of first quality.

MYOFASCITIS

To the Editor:—I have a woman patient who has repeated attacks of severe pain with swelling in the sternomastoid muscle, particularly at its insertion into the skull. She has these attacks once every week or two and they last for one or two days. She has been having them for years. I have eradicated every possible focus of infection and have used heat, massage and salicylates but have been unable to give her much relief. Will you please advise me as to what I might do in the treatment of her condition? Please omit name. M.D., Illinois.

ANSWER.—This is evidently a case of myositis fibrosa or myofascitis. When this is not due to a definite focus of infection such as the teeth, tonsils, throat or genito-urinary tract, the cause will commonly be found in the gastro-intestinal tract. Most but not all of these patients have ileac or cecal stasis.

The toxin may be bacterial or metabolic. When it is bacterial it is usually due to a streptococcus; when metabolic it may be due to the inability to handle proteins, such as meat, fish and eggs, properly or to incomplete digestion of the starches and other carbohydrates.

There may be an element of trauma in this case or exposure to extremes of heat and cold or moisture and dryness. In some of these cases there is a definite history of exposure to drafts, especially during sleep, when all physical functions, including circulation, are at a low ebb. Roentgenograms should be made in the anteroposterior and lateral projections to rule out a demonstrable arthritis.

Some of these patients are relieved by protection against drafts during sleep. Radiant heat, massage and diathermy, when given by a competent physical therapist, should be helpful. If all other methods fail to relieve the patient, she should be put in a plaster-of-paris cast immobilizing the head, neck and upper portion of the thoracic cage. If this is unsuccessful, surgical exploration is indicated to rule out hematoma or neoplasm.

CHRONIC GONORRHEA

To the Editor:—I have a case of a young man who contracted a gonococcal infection of the urethra and who neglected it so that when he came to my office he had an anterior and posterior urethritis with some epididymitis. With rest in bed, support for the scrotum, and an ice bag, the epididymitis left him. Nothing was done for him for four weeks following subsidence of the epididymitis. He came into the office with a slight urethral discharge, no urinary discomfort and no gonococci seen on staining. The first glass of urine is clear except for a few shreds. The second glass is clear, with many shreds. The prostate is large and boggy, so no massage will be attempted. The scrotum is normal in size. Urine examination reveals an abundance of pus cells clumped arond the shreds. Would you outline the treatment for this case, step by step, naming drugs and manipulations, with duration of use for each, that would eventually clear up the anterior and posterior urethritis and clear up the prostate without causing a reaction in the epididymis? What is the prognosis as to the length of time in clearing up the infection in this patient? Please omit name and address. M.D., New York.

ANSWER.—This patient is now described as having anterior and posterior infection, recovering from an acute epididymitis for four weeks, without urinary discomfort. As he had an acute epididymitis, he certainly still has a chronic seminal vesiculitis and prostatitis, not necessarily at this time gonorrheal, so that any subsequent treatment must be directed toward these structures. This man should have careful stripping of the prostate and seminal vesicles twice a week, followed by an anterior and posterior injection of 0.5 per cent strong silver protein or an anterior and posterior irrigation of 1:5,000 potassium permanganate. If this is properly and carefully done there is practically no danger of producing another attack of epididymitis. However, if it is too forcibly carried out that complication may readily recur; but since the gonococci have become materially reduced in number or have now completely disappeared, this complication is not so likely to occur.

Since there is little urethral discharge, local medication by the patient himself is not indicated.

It may be that, even after the prostate and vesicles are apparently free from pus or infection of any sort, the urine will still harbor shreds that it may be impossible to eradicate completely in some instances but can be best done by alternating massage with dilation of the prostatic urethra, followed by instillation or irrigation.

It would be impossible to make an accurate prognosis, as this would depend on the efficiency with which proper management is carried out. Probably recovery will occur between two and three months after active treatment is begun.

USE OF CAFFEINE INTRAVENOUSLY

To the Editor:—In THE JOURNAL, February 25, page 603, a correspondent inquires concerning the dosage of caffeine and states that "today some men inject intravenously with impunity 15 grains of caffeine at one time and little is heard about caffeine poisoning." The answer says: "In view of the fact that tea drinkers may take 0.6 Gm. of caffeine daily, a dose of 1 Gm., or 15 grains, would not be excessive for 'quick stimulation,' excepting that it may, along with this, produce restlessness and insomnia." The answer implies that the 15 grains may be injected intravenously with impunity. This is a dangerous practice. Several times I have seen the heart stopped almost instantaneously in animals by the rapid intravenous injection of 10 mg. of caffeine per kilogram of weight. This dose corresponds to about 10 grains for the average adult. The rapid intravenous injection of as little as 5 mg. of caffeine per kilogram may cause severe cardiac irregularity, and under exceptional conditions it might prove fatal, this dose being equivalent to one third of that mentioned by your correspondent. ROBERT A. HATCHER, M.D., New York.

ICTERUS INDEX — VIOSTEROL IN CORYZA

To the Editor:—In THE JOURNAL, February 11, appears a communication from Dr. Diamond on "Functional Capacity of the Liver" (p. 442) and an item in Queries and Minor Notes concerning "Repeated Coryza in a Child" (p. 443), on which I should like to comment.

First, Dr. Diamond takes exception to Robertson, Swalm and Konzelmann's preference for the icterus index test as compared with the van den Bergh test. He considers that a high icterus index in the event of a normal van den Bergh signifies that the yellow of a high icterus index must needs be due to a coloring matter other than bilirubin. He fails to recognize, what Meulengracht and others have noted in performing the van den Bergh test, that variable and often considerable amounts of bilirubin are carried down with the proteins when these are precipitated out of solution, and that such amounts are lost so far as their measurement is concerned. The van den Bergh test is thus not invariably accurate, even with the new, modified technic. In determining the icterus index, carotene is the only other pigment likely to be mistaken for bilirubin. Carotenemia is rare, can be accounted for by an adequate history, and is a condition, unlike jaundice, in which the sclerae do not become yellow. From one to four hours after the ingestion of one-half pound of carrots or similar carotene-containing vegetables, the icterus index rises from 5 to 10 points, depending on the concentration of the carotene, but in twelve hours it returns to normal.

The second comment I should like to make is concerning a physician who asks for reasons for repeated attacks of head colds in the case of his 6-year-old daughter. In addition to describing her symptoms he states that she has had "continued courses of malt, viosterol, and so on besides series of ultraviolet irradiations." I have noted ill effects from long-continued, daily administration of viosterol in therapeutic doses. These manifest themselves in some form of infection of the upper respiratory tract, usually coryza and cough. In certain individuals, I have seen attacks occur four or five days after taking viosterol, and continue so long as viosterol is taken. When its administration is stopped these persons recover, only to have recurrences of their coughs and colds on again taking viosterol. Apparently it is possible for some individuals to get too much vitamin D even in small doses, just as too many sunny days in succession are often found to be too stimulating. It is also possible that this reaction may be an expression of imbalance between vitamins A and D. In experiments with animals it has been found that, when vitamin D is administered, more than the ordinary amount of vitamin A is required for the health of the animal (personal communication by Dr. W. H. Eddy). Since there are variations in the amounts of vitamin A, both stored and ingested, it is conceivable that depletion of the anti-infective vitamin A may readily take place in those cases in which there is low storage, or scant intake, when vitamin D is taken too constantly.

In those individuals who acquire infections of the upper respiratory tract while taking viosterol, there are no such reactions when cod liver oil or cod liver oil concentrates are substituted for the viosterol.

ALICE R. BERNHEIM, M.D., New York.

Council on Medical Education and Hospitals

COMING EXAMINATIONS

AMERICAN BOARD FOR OPHTHALMIC EXAMINATIONS: Milwaukee, June 12. Sec., Dr. William H. Wilder, 122 S. Michigan Blvd., Chicago.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: The *general oral, clinical and pathological* examination will be held in Milwaukee, June 13. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh.

AMERICAN BOARD OF OTOLARYNGOLOGY: Milwaukee, June 12. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha.

ARKANSAS: *Basic Science.* Little Rock, May 1. Sec., Mr. Louis E. Gebauer, 1002 Donoghey Bldg., Little Rock. *Regular.* Little Rock, May 9-10. Sec., Dr. Sam J. Allbright, Box 54, Searcy. *Eclectic.* Little Rock, May 9. Sec., Dr. Claude E. Laws, 803½ Garrison Ave., Fort Smith. *Homeopathic.* Little Rock, May 9. Sec., Dr. Allison A. Pringle, Eureka Springs.

CALIFORNIA: *Reciprocity.* Los Angeles, April 19. Sec., Dr. Charles B. Pinkham, 420 State Office Bldg., Sacramento.

HAWAII: Honolulu, April 10-13. Sec., Dr. James A. Morgan, 48 Young Bldg., Honolulu.

ILLINOIS: Chicago, April 11-13. Superintendent of Registration, Mr. Paul B. Johnson, Springfield.

MINNESOTA: Minneapolis, April 18-20. Sec., Dr. E. J. Engberg, 350 St. Peter St., St. Paul.

NATIONAL BOARD OF MEDICAL EXAMINERS: *Parts I and II.* The examinations will be held at centers where there are five or more candidates, May 8-10, June 26-28, and Sept. 13-15. Ex. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

NEBRASKA: *Basic Science.* Omaha, May 2-3. Dir., Mrs. Clark Perkins, State House, Lincoln.

NEVADA: Carson City, May 1. Sec., Dr. Edward E. Hamer, Carson City.

NEW MEXICO: Santa Fe, April 10. Sec., Dr. P. G. Cornish, Jr., 221 W. Central Ave., Albuquerque.

RHODE ISLAND: Providence, April 6-7. Dir., Dr. L. A. Round, 319 State Office Bldg., Providence.

WISCONSIN: *Reciprocity.* Milwaukee, April 11. Sec., Dr. Robert E. Flynn, 401 Main St., La Crosse.

Montana October Report

Dr. S. A. Cooney, secretary, Montana State Board of Medical Examiners, reports the written examination held in Helena, Oct. 4-5, 1932. The examination covered 10 subjects and included 50 questions. An average of 75 per cent was required to pass. Eight candidates were examined, all of whom passed. Eight physicians were licensed by reciprocity with other states. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent
Bennett Medical College, Chicago		(1914)	81.6
Loyola University School of Medicine		(1930)	82.3
Northwestern University Medical School		(1931)	84.3
University of Minnesota Medical School		(1932)	87.7, 88
Creighton University School of Medicine		(1929)	84.1, (1930) 79.2, (1931) 83.2

College	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Rush Medical College		(1932, 2)	N. Dakota
University of Minnesota Medical School		(1932)	Washington
St. Louis University School of Medicine		(1930)	Missouri
John A. Creighton Medical College		(1920)	Nebraska
Vanderbilt University School of Medicine		(1915)	Alabama
Marquette University School of Medicine		(1926)	Wisconsin
Canton University Medical Department, China		(1898)	*Washington

* Verification of graduation in process.

California October Examination

Dr. Charles B. Pinkham, secretary, California State Board of Medical Examiners, reports the written examination held in Sacramento, Oct. 18-20, 1932. Forty-one candidates were examined, 36 of whom passed and 5 failed. The following colleges were represented:

College	PASSED	Year Grad.	Number Passed
College of Medical Evangelists		(1932, 6)	6
Stanford University School of Medicine		(1930), (1932, 3)	4
University of California Medical School		(1932, 3)	3
University of Colorado School of Medicine		(1932)	1
Yale University School of Medicine		(1931)	1
Loyola University School of Medicine		(1931)	1
Northwestern Univ. Med. School		(1922), (1931), (1932, 5)*	7
Rush Medical College		(1932)	1
St. Louis University School of Medicine		(1931), (1932)	2
Washington University School of Medicine		(1932)	1
University of Nebraska College of Medicine		(1932, 2)	2
Cornell University Medical College		(1930)	1
University of Oregon Medical School		(1932)	1
Medical College of Virginia		(1931)	1
McGill University Faculty of Medicine		(1928)	1
Licentiate of the Royal College of Physicians, London, and Member of the Royal Coll. of Surgs., England		(1923)	1
Faculdade de Medicina de Lisboa, Portugal		(1930)	1
Moscow State University Faculty of Medicine		(1919)†	1

College	FAILED	Year Grad.	Number Failed
University of California Medical School		(1932)	1
Karl-Franzens-Universität Medizinische Fakultät, Graz		(1928)	1
Medizinische Fakultät der Universität Wien		(1932)†	1
Regia Università di Roma degli studi Facoltà di Medicina e Chirurgia		(1928)†	1
Psycho-Neurological Institute Medical College, Russia		(1917)†	1

* One of these applicants has received an M.B. degree and will receive an M.D. degree on completion of internship.

† Verification of graduation in process.

California Reciprocity Report

Dr. Charles B. Pinkham, secretary, California State Board of Medical Examiners, reports 8 physicians licensed by reciprocity with other states and one physician licensed by endorsement from Nov. 3 to Dec. 21, 1932. The following colleges were represented:

College	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Keokuk Medical College, College of Phys. and Surgs.		(1903)	Iowa
University of Kansas School of Medicine		(1923, 2)	Kansas
University of Minnesota Medical School		(1924)	Minnesota
Creighton University School of Medicine		(1926)	Nebraska
University of Oklahoma School of Medicine		(1930)	Oklahoma
University of Oregon Medical School		(1928)	Oregon
Magyar Királyi Erzsébet Tudományegyetem Orvostudományi, Hungary		(1922)	Ohio

College	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
College of Physicians and Surgeons of Baltimore		(1895)	U. S. Army

New Mexico October Report

Dr. P. G. Cornish, Jr., secretary, New Mexico Board of Medical Examiners, reports the written examination held in Santa Fe, Oct. 10-11, 1932. The examination covered 13 subjects and included 30 questions. One candidate was examined and passed. Eight physicians were licensed by endorsement. The following colleges were represented:

College	PASSED	Year Grad.
Northwestern University Medical School		(1932)

College	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Central College of Physicians and Surgeons, Indiana		(1905)	Indiana
Kansas Medical College		(1900)	Iowa
Barnes Medical College, Missouri		(1895)	Missouri
Ohio State University College of Medicine		(1915)	Ohio
University of Tennessee College of Medicine		(1927)	Tennessee
University of Texas School of Medicine		(1931)	Texas
Medical College of Virginia		(1906)	Arizona
Dalhousie University Faculty of Medicine		(1932)	Nova Scotia

Nebraska November Examination

Mrs. Clark Perkins, director, Bureau of Examining Boards, reports the written examination held in Omaha, Nov. 29-30, 1932. The examination covered 10 subjects and included 96 questions. An average of 75 per cent was required to pass. Thirteen candidates were examined, all of whom passed. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent
University of Colorado School of Medicine		(1931)	82.1
Rush Medical College		(1932)	87.3
Harvard University Medical School		(1931)	81.8
Creighton University School of Medicine		(1931)	84.4, (1932) 83.6, 83.7, 84.5, 88.8
University of Nebraska College of Medicine		(1931)	83.3, (1932) 80, 83.6, 85
University of Wisconsin Medical School		(1931)	82

Mrs. Perkins also reports 2 physicians licensed by reciprocity with other states and one physician licensed by endorsement from July 28 to November 12. The following colleges were represented:

College	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Northwestern University Medical School		(1930)	S. Dakota
Rush Medical College		(1930)	Illinois

College	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
University of Rochester School of Medicine		(1931)	N. B. M. Ex.

Book Notices

How to Budget Health: Guilds for Doctors and Patients. By Evans Clark, Director, Twentieth Century Fund, Inc. Published for the Twentieth Century Fund, Inc. Cloth. Price, $4. Pp. 328, with 11 illustrations. New York & London: Harper & Brothers, 1933.

The reader of this book can scarcely fail to be impressed with the idea that the purpose of the book, coming as it did so closely on the heels of the Report of the Committee on the Costs of Medical Care, is to bolster the views expressed in the majority report of that committee. Although the report mentioned is referred to frequently, nothing is said about the fact that the views contained in the majority report were not unanimously concurred in; actually, of course, there were two minority reports, one of them signed by a considerable number of the physicians on the committee who are engaged in treating the sick, and two dissenting opinions by laymen who would not sign the majority report.

The author of this book is the director of the Twentieth Century Fund, Inc., the founder of which, Edward A. Filene, was greatly interested in developing the committee, as stated in an editorial in THE JOURNAL. Although this interest and initial stimulus has been denied by some members of the executive board of the committee, the following statement is found in Mr. Clark's preface:

> The Twentieth Century Fund has for some years been interested in the solution of this problem. Its president, Edward A. Filene, was active in the formation of the Committee on the Costs of Medical Care, which has now completed a five year program of research designed to obtain the essential facts of the situation and to suggest constructive measures for the mitigation of existing evils. The Twentieth Century Fund assisted in underwriting the organization of the Committee in 1927 and the formulation of its program. It also made annual contributions toward its work.

How to budget health is described in chapter 1, as the medical guild plan. The material in chapter 1 has been taken largely from an article by the director of the fund which appeared in the *Atlantic Monthly* in October, 1930, entitled "A Cure for Doctors' Bills."

A medical guild may be defined as "an institution which combines all of the following elements: (1) an all-around medical service, including hospitalization, without any drastic limitations and exceptions, through a well balanced group of doctors; (2) a fixed annual fee covering such service; and (3) periodic health examinations," this service to be given to all members or subscribers of the guild. Medical guild seems to be but another term for group practice or hospital medical center, as proposed in the majority report of the Committee on the Costs of Medical Care. The guild plan, however, is elaborated on much more extensively and contains features not brought out in the report. It is a utopian scheme designed to relieve the medical profession, or at least those members who constitute the guilds, of which there may be many, of their worries and cares by creating for them a larger and more stabilized net income, and for the members or subscribers of the guild the highest type of complete medical service at a lower operating cost, for a fixed fee.

In the succeeding chapters an attempt is made to convince one how these two commendable but somewhat contradictory ends may be accomplished. A group of well established doctors of the highest medical attainments are to organize and incorporate as a guild.

The next question is how to secure members or subscribers. It is supposed that each doctor in the group as soon as the formation of the guild has been publicly announced would bring all of his families and patients into the guild as subscribers. This would start the guild right with several hundred or possibly thousand subscribers, depending on the number and standing of the medical men comprising the guild. Other persons would become attracted to the plan (so it is thought) by favorable friendly newspaper articles and "by personal solicitation by the word of mouth of satisfied patrons." "Even a new and independent guild organization would of necessity be automatically self recruiting."

The problem of "selling" the guild to the public is obviously of primary importance. It must "not violate the ethics of the profession as interpreted by those who control its destinies in the locality where the guild is established." The methods used to recruit members are by paid advertisements, by direct mail promotion and by personal solicitation—methods that are contrary to recognized ethical ideas.

"Any estimate of the fee to be charged by the medical guild depends necessarily on two factors:

"*The size of the guild.* The cost must be guessed in advance in order to show how much income must be obtained per year to cover the expenses of operation.

"*The number of subscribers.* The fee charged to each subscriber would vary directly with the number called upon to divide the costs." The cost of adequate medical care is placed at $42.55 per person, which sum "may be taken as a rough estimate of the fee which medical guilds would have to charge. It must be carefully noted, however, that this is an *average* figure. The costs in large centers like New York and Chicago would be greater than smaller towns and consequently guild fees would have to be higher. It is probable, however, that guild service could be given even in the largest cities for from $50 to $60 per year per person."

It is frankly admitted that, if the older men with well established practices could not be induced to give up their private work and join a guild, younger men, recent interns or assistants might be secured for the salaries paid.

At one place it is stated that these guilds would be successful financially and be able to pay the physicians larger salaries than they had earned in private practice. At another it is claimed that for the first few years they would not be able to meet expenses and that it would be necessary to have some kind philanthropist subsidize the guilds in order that they may be able to pay the running expenses. Another solution of this phase of the question which is proposed by the author is that the state by general taxation pay the subscription fee for all those who are unable to pay it themselves. This is but another way of proposing compulsory health insurance under government supervision.

In discussing the guild plan, Mr. Clark says that it was found to be illegal in New York State, where it was suggested that it might be tried, as "the general rule that a corporation cannot practice medicine is well established in New York." It is also pointed out that the scheme would probably come under the laws governing insurance agencies. However, the author naively remarks that there may be some way found to beat the law.

The book makes an evening's interesting reading, but the scheme proposed is so replete with uncertainties and objectionable features that it cannot be said to offer much of value in solving the question of medical care for the people.

Précis clinique et opératoire de chirurgie infantile. Par L. Ombrédanne, professeur de clinique chirurgicale infantile à la Faculté de médecine de Paris. Third edition. Cloth. Price, 140 francs. Pp. 1479, with 1008 illustrations. Paris: Masson & Cie, 1932.

The first edition of Ombrédanne's monograph on clinical and operative pediatric surgery appeared in 1923. The book is one of a set known as the Collection de précis médicaux, consisting of short works or compendiums especially for students and physicians who desire a concise volume. Although prepared in a handy size and as a compendium, this edition covers so many pages that, in combination with comparatively small type, it is in reality a textbook. It is well illustrated. The matérial is divided into two parts. The first part, covering about 250 pages, deals with general pathology. After a short discussion concerning the question of anesthesia, preparation for operation, hemostasis and postoperative complications, this section ends with a discussion of rapid death occurring postoperatively with pallor and hyperthermia, a condition that occurs most frequently in infants between the ages of 6 days and 6 months, less often during the last six months of the first year, and later, being progressively rarer as the age increases. Without claiming to know the cause, the author says that it is not due to dehydration, bronchopneumonia, hemorrhage, shock or swallowed blood and that there is no proof that it is caused by hepatic insufficiency, acute hydrocephalus, anaphylactic shock or traumatic shock, though these all are spoken of hypothetically. Prophylactic measures advocated are continuance of the usual regimen, avoidance of purging, the use of general anesthesia, rapid performance of operations, and certain postoperative measures. If the condition has developed, he recommends cold baths, beginning at room

temperature and gradually being made colder. The bath lasts two hours, and, after an intermission of two hours, if it is still indicated, it is repeated. In addition, he gives epinephrine by mouth, 3 drops at a time, with the feedings, up to a total of from 20 to 30 drops. The other topics discussed in the first part include traumatisms, dystrophies of bones, infections of bones and joints, and tumors. The second portion of the volume, of about 1,200 pages, consists of regional presentation of the pathologic conditions and surgery of infancy. The congenital malformations of each region are discussed first, and then the acquired lesions and diseases. Etiology, pathology, symptoms, diagnosis and treatment are fully presented. Indications for and descriptions of operations are given in detail. Only those procedures are described which the author has found to be of value and can personally recommend. The material has been brought down to date, is surprisingly full for a volume for students and, indeed, is of interest and value for any surgeon who is able to read French.

Diseases of the Mouth. By Sterling V. Mead, D.D.S., M.S., B.S., Professor of Oral Surgery and Diseases of the Mouth, Georgetown University Dental School. Fourth edition. Cloth. Price, $10. Pp. 932, with 563 illustrations. St. Louis: C. V. Mosby Company, 1932.

This book attempts to cover in a comprehensive manner the whole field of pathology, diagnosis and treatment of all diseases of the mouth. The author states in the introduction: "This volume has been written primarily as a textbook for dental and medical students." Since neither the physician nor the dentist is likely to be favorably impressed by the manner in which his particular field is covered, one may question the attainment of the purpose quoted. The pathologist is faced by not less than sixty photomicrographs either without significance or unsuited for the purposes of teaching and illustration. The material on laboratory technic is covered much more adequately in the special textbooks on laboratory diagnosis. Such subject matter as that on dental caries (chapter VI) must prejudice the dentist against the book as a whole. The clinical surgeon must lose faith in an author who proposes in the chapter on osteomyelitis (p. 640) that "at least 30 ounces of orange juice should be taken daily." On the other hand, there are features of the book that are highly commendable, which, in spite of the defects just mentioned, will recommend it to many for use either as a textbook or as a reference book. The text is complemented by numerous accurate reproductions of roentgenograms covering a wide range of conditions; the subject matter on diagnosis, testing tooth vitality and use of transillumination is well worth reading and careful study, and each chapter is followed by a comprehensive bibliography.

Der Äbtissin Hildegard von Bingen Ursachen und Behandlung der Krankheiten (causae et curae). Uebersetzt von Professor Dr. Hugo Schulz. Paper. Price, 10.80 marks. Pp. 235. Munich: Verlag der Aerztlichen Rundschau Otto Gmelin, 1933.

The author, who combines linguistic scholarship with an intuitive understanding of the spirit of the twelfth century, deserves thanks for making it easy to study one of the earliest documents of German monastic medicine. It is a strange mixture of the teachings of Galen, revived at the school of Salerno, and of the teachings of the Bible. Intermingled with the theological theories are the keen personal observations of the nun, her quite modern conceptions of the constitutional fundamentals of human disease, and an insight into the insufficiency of the pharmaceutics of her time: "These prescriptions have been given by God himself, and they will either cure man or he has to die, or God does not desire that he shall be cured from his disease."

A New Physiology of Sensation Based on a Study of Cardiac Action. By W. Burridge, D.M., M.A., Professor of Physiology, Lucknow University. Cloth. Price, $1.50. Pp. 70. New York & London: Oxford University Press, 1932.

Although this small volume may contain a record breaking philosophical discussion of a physiologic process, namely, sensation, it seems rather to be a word or sentence salad. A newly coined jargon used in well rounded sentences gives the reader no inkling of what the author has in mind, in spite of the sixty-seven pages of text. No practitioner of medicine will care to read the book.

Economic Mammalogy. By Junius Henderson, Curator of University of Colorado Museum, and Elberta L. Craig, Museum Assistant. Cloth. Price, $4.50. Pp. 397. Springfield, Illinois: Charles C. Thomas, 1932.

The authors have attempted to bring together from widely scattered sources as much information as possible concerning the economic relations of mammals both to one another and to man. It has been impossible to include the entire 12,540 species and varieties of mammals known to exist on earth, but most of those in North America as well as many in other parts of the world are discussed. The book is divided into two parts. Part I deals with a general discussion on such topics as mammals as a source of food, their relation to the industries such as the fur and leather trades, and their esthetic relations to man, as pets and as game, and so on. In the two short chapters on diseases of animals and their parasites, it is disappointing to note that, while a whole page is given over to the discussion of tularemia, the much more economically important disease of bovine tuberculosis is dismissed with one sentence quoting statistics eighteen years old. Part II is devoted to a systematic discussion of various orders and families, from the primitive egg laying mammals of Australasia to the primates up to but not including man. This furnishes a quick reference, giving the salient facts concerning the economic importance of the various mammals. The book is written in a readable language which does not require an extended knowledge of zoology to understand. There are copious footnotes and references on almost every page, which form the chief recommendation for the publication.

Medicolegal

Practice of Dentistry by a Corporation

(Parker v. Board of Dental Examiners of State of California (Calif.), 14 P. (2d) 67)

A corporation, operating under the corporate name "Painless Parker Dentist," was organized under the laws of California to conduct, own, operate and control dental offices. It appointed one of its incorporators, Painless Parker by name, a licensed dentist, as its manager and chief surgeon. The corporation, in conjunction with another, the Associated Dental Supply Company, operated a chain of dental offices. Parker employed a licensed dentist to manage each office, and each such manager employed licensed dentists to perform necessary dental operations in the office in his charge. Parker, however, maintained the management and supervision of the entire business. The California board of dental examiners deemed Parker's conduct unprofessional and suspended for five years his license to practice dentistry. The district court of appeal, first district, division 2, California, set aside the order of the board (*Parker v. Board of Dental Examiners*, 1 Pac. (2d) 501; THE JOURNAL **98**:2311 [June 25] 1932). The board thereupon appealed to the Supreme Court of California.

The board contended that conducting, owning, operating and controlling dental offices constituted the practice of dentistry within the purview of section 11 of the dental practice act; that a corporation cannot be licensed to practice dentistry; and that any licensed dentist who aids a corporation in performing any of the acts named above is aiding "an unlicensed person" to practice. Parker claimed, however, that the term "unlicensed person," as used in the prohibition of "aiding and abetting any unlicensed person to practice dentistry unlawfully," refers only to natural persons, who might be licensed under the act, and not to a corporation owning or operating a dental office.

It must be conceded, said the Supreme Court, that the legislature has power to regulate the practice of dentistry. Good moral character and "fitness" to practice dentistry are statutory requirements imposed by the dental practice act. The letter of the act authorizes *persons* only to engage in the *practice* of dentistry. The underlying theory on which the whole system of dental laws is framed is that the state's licentiates shall possess consciousness, learning, skill, and good moral character, all of which are individual characteristics, and none of which is an attribute of an artificial entity.

Surely the state, for the better regulation of the practice of dentistry and as a means of preventing evasions of the law, and with the object of more readily fixing statutory responsibility, has the power to limit such practice to natural persons.

Parker insisted that there is a distinction between the practice of dentistry, which the statute undertakes to regulate, and the purely business side of the practice, and that if the management or conduct of the "business side" by a layman is inhibited by statute, then the statute is to that extent unconstitutional. But, said the Supreme Court, the law does not assume to divide the practice of dentistry into departments of that kind. The subject is treated as a whole and must be so treated necessarily. If Parker's contention is sound, then the proprietor of the business may be guilty of gross misconduct in its management and violate all standards which a licensed dentist would be required to respect, and stand immune from any regulatory supervision whatsoever. His employee, the licensed dentist, would also be immune from discipline, on the ground that he was but a mere employee and was not responsible for his employer's misconduct. Public policy will not countenance such a condition. If Parker's contention is sound, the dental practice act is impotent to accomplish the purpose it was intended to serve, namely, to promote the safety, health and welfare of the people of the state.

In the opinion of the court, the corporate practice of dentistry tends to relegate the welfare of the patient to the pecuniary interests of the corporation. In this case, the court said, Painless Parker Dentist, a corporation, and the Associated Dental Supply Company, a corporation, are the employers of Painless Parker, the licensed dentist. The corporations, which are purely commercial enterprises and none of whose directors need be licensed dentists, are the masters of the situation and may with or against the wish of Painless Parker, the dentist, employ such licensed persons as may be to their commercial advantage, having less regard for the skill or fitness of the persons so employed than would a licensed proprietor who is solemnly charged by the obligation he assumes to the state to respect the salutary provisions of the dental practice act. If Painless Parker, the licensed dentist, owed his first allegiance to his employers, the corporations, then he owed but a secondary and divided loyalty to the patient.

The practice of dentistry is not open to commercial exploitation. Such would be its fate if the methods adopted by Parker, the defendant, should become general. That a corporation may not practice law, medicine or dentistry is a settled question in California. These professions, involving a relationship of a personal as well as a professional character, cannot be placed in the same category as pharmacy, architecture or other vocations wherein no such relationship exists.

Parker contended that the long period of time during which he had operated and the interpretation that the board and its legal advisers had placed on the dental practice act during that period in permitting him to operate were entitled to weight in this proceeding. For a period of some fourteen years, said the court, the board and Parker have had frequent controversies as to the legality and professional propriety of the methods he employed in the practice of dentistry. At no time was the subject set at rest. Delayed action, however, on the part of those charged with the execution of a law will not be permitted to annul the law. It may be considered by the court as a reason for mitigating punishment, but the court is not absolutely bound to regard it.

For the reasons stated, the order of the board suspending Parker's license to practice dentistry for five years was affirmed.

Epidemic Meningitis an Accidental Injury.—Arquin, an intern in the Cook County Hospital, assigned to the contagious ward, contracted epidemic meningitis and died. His widow sought compensation under the Illinois workmen's compensation act. An award by an arbitrator in her favor was set aside by the industrial commission but affirmed by the circuit court, Cook County, and by the Supreme Court of Illinois. An injury, said the Supreme Court, may be occasioned as readily by disease as by a blow. A disease accidentally acquired may be an accidental injury. When Arquin contracted epidemic meningitis and died, he died as the result of an accidental injury arising out of and in the course of his employment as an intern in the Cook County Hospital.—*Arquin v. Industrial Commission (Ill.), 181 N. E. 613.*

Society Proceedings

COMING MEETINGS

Alabama, Medical Association of the State of, Montgomery, April 18-21. Dr. D. L. Cannon, 519 Dexter Avenue, Montgomery, Secretary.
American Association for the Study of Goiter, Memphis, Tenn., May 15-17. Dr. J. R. Yung, 670 Cherry Street, Terre Haute, Ind., Secretary.
American Association for Thoracic Surgery, Washington, D. C., May 9-11. Dr. Duff S. Allen, 3720 Washington Boulevard, St. Louis, Secretary.
American Association of Anatomists, Cincinnati, April 13-15. Dr. George W. Corner, University of Rochester School of Medicine, Rochester, N. Y., Secretary.
American Association of Genito-Urinary Surgeons, Washington, D. C., May 8-10. Dr. Henry L. Sanford, 1621 Euclid Avenue, Cleveland, Secretary.
American Association of Pathologists and Bacteriologists, Washington, D. C., May 2-3. Dr. Howard T. Karsner, 2085 Adelbert Road, Cleveland, Secretary.
American Bronchoscopic Society, Washington, D. C., May 10. Dr. Edwin McGinnis, 104 South Michigan Boulevard, Chicago, Secretary.
American Gastro-Enterological Association, Washington, D. C., May 8-9. Dr. John Bryant, 311 Beacon Street, Boston, Acting Secretary.
American Gynecological Society, Washington, D. C., May 8-10. Dr. Otto H. Schwarz, 630 South Kingshighway, St. Louis, Secretary.
American Laryngological Association, Washington, D. C., May 9-10. Dr. George M. Coates, 1721 Pine Street, Philadelphia, Secretary.
American Neurological Association, Washington, D. C., May 9-11. Dr. Henry A. Riley, 117 East 72d Street, New York, Secretary.
American Ophthalmological Society, Washington, D. C., May 8-10. Dr. J. Milton Griscom, 2213 Walnut Street, Philadelphia, Secretary.
American Orthopedic Association, Washington, D. C., May 8-10. Dr. DeForest P. Willard, 1916 Spruce Street, Philadelphia, Secretary.
American Otological Society, Washington, D. C., May 8-9. Dr. Thomas J. Harris, 104 East 40th Street, New York, Secretary.
American Pediatric Society, Washington, D. C., May 8-10. Dr. Hugh McCulloch, 325 North Euclid Avenue, St. Louis, Secretary.
American Physiological Society, Cincinnati, April 10-12. Dr. Frank C. Mann, Mayo Institute, Rochester, Minn., Secretary.
American Society for Clinical Investigation, Washington, D. C., May 8. Dr. H. L. Blumgart, Beth Israel Hospital, Boston, Secretary.
American Society for Experimental Pathology, Cincinnati, April 10-12. Dr. C. Phillip Miller, Jr., University of Chicago Department of Medicine, Chicago, Secretary.
American Society for Pharmacology and Experimental Therapeutics, Cincinnati, April 10. Dr. V. E. Henderson, Medical Building, University of Toronto, Toronto, Canada, Secretary.
American Society of Biological Chemistry, Cincinnati, April 10-12. Dr. Howard B. Lewis, University of Michigan Medical School, Ann Arbor, Mich., Secretary.
American Surgical Association, Washington, D. C., May 8-10. Dr. Vernon C. David, 59 East Madison Street, Chicago, Secretary.
Arizona State Medical Association, Tucson, April 20-22. Dr. D. F. Harbridge, 822 Professional Building, Phoenix, Secretary.
Arkansas Medical Society, Hot Springs, May 2-4. Dr. William R. Bathurst, 814 Boyle Building, Little Rock, Secretary.
Association of American Physicians, Washington, D. C., May 9-10. Dr. James H. Means, Massachusetts General Hospital, Boston, Secretary.
California Medical Association, Del Monte, April 24-27. Dr. Emma W. Pope, 450 Sutter Street, San Francisco, Secretary.
Congress of Physicians and Surgeons of North America, Washington, D. C., May 9-10. Dr. John T. King, Jr., 1210 Eutaw Place, Baltimore, Secretary.
Connecticut State Medical Society, Hartford, May 24-25. Dr. Charles W. Comfort, Jr., 27 Elm Street, New Haven, Secretary.
District of Columbia, Medical Society of the, Washington, May 3. Dr. C. B. Conklin, 1718 M Street N. W., Washington, Secretary.
Federation of American Societies for Experimental Biology, Cincinnati, April 10-12. Dr. C. Phillip Miller, Jr., University of Chicago Department of Medicine, Chicago, Secretary.
Georgia, Medical Association of, Macon, May 9-12. Dr. Allen H. Bunce, 139 Forrest Avenue, N. E., Atlanta, Secretary.
Harvey Cushing Society, Louisville, Ky., April 13-14. Dr. Tracy J. Putnam, 818 Harrison Avenue, Boston, Secretary.
Illinois State Medical Society, Peoria, May 16-18. Dr. Harold M. Camp, Lahl Building, Monmouth, Secretary.
Iowa State Medical Society, Des Moines, May 10-12. Dr. Robert L. Parker, 3510 Sixth Avenue, Des Moines, Secretary.
Kansas Medical Society, Lawrence, May 2-4. Dr. J. F. Hassig, 804 Huron Building, Kansas City, Secretary.
Maryland, Medical and Chirurgical Faculty of, Baltimore, April 25-26. Dr. Walter Dent Wise, 1211 Cathedral Street, Baltimore, Secretary.
Minnesota State Medical Association, Rochester, May 22-24. Dr. E. A. Meyerding, 11 West Summit Avenue, St. Paul, Secretary.
Mississippi State Medical Association, Jackson, May 9-11. Dr. T. M. Dye, Clarksdale, Secretary.
Missouri State Medical Association, Kansas City, May 1-4. Dr. E. J. Goodwin, 634 North Grand Boulevard, St. Louis, Secretary.
Nebraska State Medical Association, Omaha, May 23-25. Dr. R. B. Adams, Center McKinley Building, Lincoln, Secretary.
New Hampshire Medical Society, Manchester, May 16-17. Dr. D. E. Sullivan, 7 North State Street, Concord, Secretary.
New York, Medical Society of the State of, New York, April 3-5. Dr. Daniel S. Dougherty, 2 East 103d Street, New York, Secretary.
North Carolina, Medical Society of the State of, Raleigh, April 17-19. Dr. L. B. McBrayer, Southern Pines, Secretary.
Northern Tri-State Medical Association, La Porte, Indiana, April 11. Dr. E. P. Gillette, 320 Michigan Street, Toledo, Ohio, Secretary.
Oklahoma State Medical Association, Oklahoma City, May 15-17. Dr. C. A. Thompson, Commercial National Bank Building, Muskogee, Secretary.
Society for the Study of Asthma and Allied Conditions, Washington, D. C., May 6. Dr. W. C. Spain, 116 East 53d Street, New York, Secretary.
South Carolina Medical Association, Spartanburg, April 18-19. Dr. E. A. Hines, Seneca, Secretary.
South Dakota State Medical Association, Huron, May 15-17. Dr. John F. D. Cook, Langford, Secretary.
Tennessee State Medical Association, Nashville, April 11-13. Dr. H. H. Shoulders, 706 Church Street, Nashville, Secretary.
Texas, State Medical Association of, Fort Worth, May 8-11. Dr. Holman Taylor, Medical Arts Building, Fort Worth, Secretary.
West Virginia State Medical Association, Charleston, May 8-10. Mr. Joe W. Savage, Professional Building, Charleston, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to THE JOURNAL in continental United States and Canada for a period of three days. Issues of periodicals are kept on file for a period of five years only. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending, but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Heart Journal, St. Louis

8: 155-296 (Dec.) 1932

*Clinical Type of Paroxysmal Tachycardia of Ventricular Origin in Which Paroxysms Are Induced by Exertion. F. N. Wilson, S. W. Wishart, A. G. Macleod and P. S. Barker, Ann Arbor, Mich.—p. 155.
Further Observations on Heart in Old Age: Postmortem Study of Three Hundred and Eighty-One Patients Aged Seventy Years or More. F. A. Willius and H. L. Smith, Rochester, Minn.—p. 170.
Rheumatic Heart Disease: II. Incidence and Distribution of Age of Death. D. Davis and Soma Weiss, Boston.—p. 182.
Experiences with Dermatherm (Tycos) in Relation to Peripheral Vascular Disease: II. Study of Abnormal Conditions. H. C. Eddy and H. P. Taylor, Cleveland.—p. 190.
*Unusual Dilatation of Left Auricle. C. F. Nichols and H. W. Ostrum, Philadephia.—p. 205.
*Spontaneous Rupture of Aorta. H. Arenberg, Ellis Island, N. Y.—p. 217.
Variations in Potency of Certain Commercial Preparations of Digitalis. R. L. Levy, H. G. Bruenn and S. S. Ellis, New York.—p. 226.
Minimal Toxic and Lethal Dosage of Digitalis in Experimental Hyperthyroidism and Hypothyroidism. R. G. Hahn, Boston, and H. Rosenblum, San Francisco.—p. 235.
Observations on Electrocardiography in Heart Disease Associated with Pregnancy, with Especial Reference to Axis Deviation. F. B. Carr, Worcester, Mass., and R. S. Palmer, Boston.—p. 238.
Notes on Heart Failure: Report of Case of Pure Left Ventricular Failure. H. M. Korns, Iowa City.—p. 242.
Note on Transmission of Aortic Systolic Murmurs to Abdominal Aorta. R. F. Hiestand and R. S. Morris, Cincinnati.—p. 249.
Occurrence of Subacute Bacterial Endocarditis in Mitral Valvular Disease, with Preexisting Auricular Fibrillation: Case Report. C. E. de la Chapelle and I. Graef, New York.—p. 252.
Effect of Asphyxia and of Anoxemia on Electrocardiogram. W. B. Kountz, St. Louis, and M. Hammouda, Cairo, Egypt.—p. 259.
Paroxysmal Hypertension Associated with Ganglioneuroma of Suprarenal Medulla. Evelyn Rogers, New York.—p. 269.
Amplifier for Heart Sounds Operating on Alternating Current. F. D. Johnston and L. I. Barbier, Ann Arbor, Mich.—p. 275.

Paroxysmal Tachycardia of Ventricular Origin.—Wilson and his associates report four cases of paroxysmal tachycardia and review the eighteen cases reported in the literature. They conclude that there is a type of paroxysmal ventricular tachycardia in which the abnormal mechanism is induced by emotion and exertion. The attacks may be long, but more often short attacks separated by periods of extrasystolic arrhythmia occur in rapid succession. In the majority of the cases there is no other evidence of cardiac disease. Patients with this disorder are usually seriously incapacitated. Small doses of quinidine are often beneficial but do not always prevent the occurrence of attacks. In one of the cases studied by the authors a long paroxysm of ventricular tachycardia was frequently interrupted temporarily by short attacks of paroxysmal auricular tachycardia.

Dilatation of Left Auricle.—Nichols and Ostrum present five cases showing unusual dilatation of the left auricle. Esophageal obstruction was produced in two and was so pronounced in one as to lead to gastrostomy. In three of the patients the left auricle extended far to the right and formed a portion of the right cardiac border. Early in the disease, roentgen examination is essential for the correct diagnosis, but in later stages diagnosis may be suspected clinically from fairly suggestive physical signs. The symptoms, physical signs, pathologic changes and vascular dynamics of this condition are reviewed. It is practically always seen in rheumatic hearts with mitral stenosis and auricular fibrillation. The exercise tolerance and lack of congestive failure in some patients is remarkable.

Spontaneous Rupture of Aorta.—Arenberg gives a detailed report of a case of spontaneous rupture of the aorta into the pericardium in which careful histologic examination failed to reveal contributory pathologic changes. Instances of such spontaneous rupture are not rare, but the condition is practically never recognized during life. A review of the literature shows that such ruptures occur twice as frequently in males as in females; age seems not to be an important factor; in many instances no changes have been found in the aortic wall, and most of such tears take place in the ascending aorta and are transverse. At first usually the rupture involves only the intima and the media; the latter is then separated from the adventitia by a dissecting hematoma, which ultimately ruptures through the adventitia at some distance from the point of the primary tear. Frequently the external rupture takes place into the pericardial sac.

American Journal of Physiology, Baltimore

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Intraperitoneal Administration of Viosterol in Mice. J. W. Spies and G. P. Lyman, New Haven, Conn.—p. 527.
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Some Mechanisms Involved in Regulation of Circulation. W. F. Hamilton, Washington, D. C.—p. 551.
Movements of Base of Ventricle and Relative Constancy of Cardiac Volume. W. F. Hamilton and J. H. Rompf, Washington, D. C.—p. 559.
Studies in B Vitamins: I. Statistical Comparison of Small and Large Litters of Rats on Normal Stock Diet. C. U. Moore, H. B. Plymate, Bessie J. Andrew and Viola White, Portland, Ore.—p. 566.
Id: II. Statistical Comparison of Rat Litters on Normal Stock Diets with Litters on Synthetic Diets Containing Varying Amounts of Vitamin B Complex and Combinations of B_1 and B_2. C. U. Moore, H. B. Plymate, Bessie J. Andrew and Viola White, Portland, Ore.—p. 573.
Id: III. Evidence of Third Vitamin B Factor in Yeast (B_4) as Shown by Growth Curves and Clinical Symptoms of First and Second Litter Young of Mothers Raised on Synthetic B_1 and B_2 Diets. C. U. Moore, H. B. Plymate and Bessie J. Andrew, Portland, Ore.—p. 581.
Id: IV. Report of Litters Obtained on Diet in Which Feces Were Supplied as Sole Source of Vitamin B. C. U. Moore, H. B. Plymate and Viola White, Portland, Ore.—p. 593.
Id.: V. Study of Myelin Degeneration in Peripheral Nerves of Rats as Associated with Low Vitamin B Content of Diet. C. U. Moore, H. B. Plymate and Bessie J. Andrew, Portland, Ore.—p. 598.
Id: VI. Further Consideration of Pyloric Obstruction in Rats. C. U. Moore and H. B. Plymate, Portland, Ore.—p. 605.
*Effect of Celiac Ganglionectomy on Sugar Tolerance of Dogs. G. de Takáts and F. P. Cuthbert, Chicago.—p. 614.
Blood Uric Acid Following Intravenous Administration of Uric Acid in Normal Dogs. C. M. Wilhelmj and S. L. Moskowitz, Omaha.—p. 620.
Effect of Anoxemia on Digestive Movements of Stomach. G. Crisler, E. J. van Liere and W. T. Booher, Morgantown, W. Va.—p. 629.
*Effect of Small Quantities of Galactose on Human Respiratory Exchange. T. M. Carpenter and R. C. Lee, Boston.—p. 635.
Comparison of Respiratory Exchange of Men and Women as Affected by Ingestion of Galactose. T. M. Carpenter and R. C. Lee, Boston.—p. 646.
Comparison of Effects on Human Respiratory Exchange of Hexoses Ingested Separately and Together. T. M. Carpenter and R. C. Lee, Boston.—p. 659.
Diurnal Cycle in Liver: I. Periodicity of Cycle, with Analysis of Chemical Constituents Involved. G. M. Higgins, J. Berkson and Eunice Flock, Rochester, Minn.—p. 673.
Electromyographic Studies of Gastro-Intestinal Tract: I. Correlation Between Mechanical Movement and Changes in Electrical Potential During Rhythmic Contraction of Intestine. J. Berkson, E. J. Baldes and W. C. Alvarez, Rochester, Minn.—p. 683.
Effects of Cortico-Adrenal Extract on Glycolysis In Vitro. H. Silvette.—p. 693.
*Blood Cellular Changes in Adrenal Insufficiency and Effects of Cortico-Adrenal Extract. E. L. Corey and S. W. Britton, Charlottesville, Va.—p. 699.
Influence of Cortico-Adrenal Extract on Energy Output. E. Eagle, S. W. Britton and R. Kline, Charlottesville, Va.—p. 707.
Study on Metabolism of Glutathione. V. Schelling.—p. 714.

Effect of Celiac Ganglionectomy on Sugar Tolerance.—De Takáts and Cuthbert studied the effect of celiac ganglionectomy on the sugar tolerance of normal dogs. They observed that the intravenous sugar tolerance of normal dogs does not vary spontaneously under basal conditions. The removal of the celiac ganglion results in a decided, persistent rise in tolerance in every instance. Dextrose administered intravenously disappears more rapidly from the blood stream than before the operation. The dogs become more susceptible to insulin. Denervation of the liver does not have a similar action. These data show that the celiac ganglion mediates nerve impulses, the exclusion of which brings about either an increased insulin production or a reduction in the insulin requirement.

Effect of Galactose on Human Respiratory Exchange.—Carpenter and Lee determined the effects of the ingestion of from 5 to 40 Gm. of galactose on the respiratory quotient and the total metabolism in a human subject by means of an open

circuit respiration apparatus and a helmet. The base line for the day was measured in from three to four fifteen-minute periods, and ten fifteen-minute periods were run after the sugar was taken. The subject had a low tolerance for this sugar, as the total reducing substances in the urine for approximately three hours varied from 0.7 Gm. after the ingestion of 5 Gm. to 3.1 Gm. after the ingestion of 40 Gm. of galactose. All amounts of galactose caused a rise in the respiratory quotient, the maximum rise in a period varying from 0.04 with 5 Gm. to 0.17 with 40 Gm. This sugar somewhat resembles fructose in its effects on the quotient, although it differs from both fructose and dextrose in that there was a fall to below the preingestion level during the latter part of the two and one-half hours after ingestion. The rise in apparent carbohydrate combustion varied from 1.1 to 12.8 Gm., which represented from 13 to 32 per cent of the amount ingested. The maximum increase in heat production over the base line level in a fifteen minute period varied from 10 per cent with 10 Gm. to 18 per cent with 40 Gm. The summation of increases in heat production in successive periods varied from 0.6 calory with 5 Gm. to 12.6 calories with 40 Gm. and the specific dynamic action varied from 3 to 8 per cent. Galactose resembles fructose in its effects on the respiratory quotient and carbohydrate combustion and resembles dextrose in its effects on the heat production.

Cortical Suprarenal Extract and Blood Cells.—Corey and Britton state that suprarenalectomy produces marked numerical changes in the cellular elements of the blood. With the development of symptoms of suprarenal insufficiency, the erythrocytes commonly increase from 50 to 100 per cent; this change is probably due to fluid loss from the blood. The total leukocyte counts are meanwhile found to be decreased to a similar extent. There are pronounced reductions in the neutrophil counts, sometimes almost to the disappearing point. The lymphocytes show a concomitant increase in percentage. The administration of cortical suprarenal extract to animals suffering from severe suprarenal insufficiency and showing profound blood cellular disorganization resulted in complete restitution of the normal cell values. Recovery of the blood cell elements to normal values was coincident with general improvement in the condition of the animal. Control experiments with epinephrine, dextrose and saline solutions were negative, with the exception of the partly effective action of epinephrine on the white rat. There were no noteworthy leukocytic changes in the splenectomized controls. Splenectosuprarenalectomized animals showed responses after operation and after extract treatment, however, which were similar to those mentioned. The authors consider the possibility that the neutrophilopenia of suprarenal insufficiency is related to the clinical condition of "agranulocytosis."

Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill.

28: 721-866 (Dec.) 1932

Treatment of Epithelioma of Skin: Indications for Radium Therapy. L. Taussig, San Francisco.—p. 721.
Radiation Therapy of Cancer of Skin. M. Cutler, Chicago.—p. 724.
*Squamous Cell Carcinoma of Skin. C. L. Martin, Dallas, Texas.—p. 728.
Treatment of Cutaneous Malignant Neoplasms. G. M. MacKee, New York.—p. 738.
*Roentgen Treatment over Vegetative Nerve Centers or Ganglions in Diseases Presenting Symptoms of Disturbances of Vegetative Nervous System: Based on Study Extending over Period of Five Years. H. Langer, Pittsburgh.—p. 747.
Preconception Ovarian Radium Irradiation of Albino Rat (Mus Norvegicus-Albinus): Biologic Study. G. S. de Rényi, Marguerite de Rényi and D. P. Murphy, Philadelphia.—p. 764.
Various Radiopaque Substances and Their Toxicity When Used to Visualize Reticulo-Endothelial System of Laboratory Animals. J. N. Ané and L. J. Menville, New Orleans.—p. 784.
*Injection of Iodized Poppy-Seed Oil into Knee Joint: Warning Against Its Use. M. S. Burman, I. S. Tunick and M. Pomeranz, New York.—p. 787.
Trachea in Nonsyphilitic Disease of Ascending Aorta and Aortic Arch. W. Chester, New York.—p. 796.
Urethral Calculi. W. R. Brooksher, Jr., Fort Smith, Ark.—p. 801.
Gallstones Confused with Colon Diverticula. H. E. Potter, Chicago.—p. 803.
Calcifications in Spleen. H. Rudisill, Jr., Charleston, S. C.—p. 805.
Diaphragmatic Hernia with Severe Anemia. M. Weitzen, New York.—p. 808.
Aiding Research in Radiology. R. H. Stevens, Detroit.—p. 813.

Squamous Cell Carcinoma of Skin.—Martin states that the number of cures of squamous cell carcinoma of the skin produced by efficient irradiation equal those produced by surgery and that the cosmetic results are much better. The pessimistic attitude that exists among dermatologists is apparently due to extreme conservatism and inadequate dosage. Surgical methods are valuable adjuncts in treating tumors growing on cartilage and in neck dissections when only one or two malignant glands are present. It is the author's custom to treat all primary squamous cell skin lesions with roentgen radiation alone unless marked induration is felt beneath the tumor or the process extends well out onto a mucous membrane as, for instance, at the corner of the mouth. In such cases the treatment is supplemented with radium. Before primary lesions are treated, they are surrounded by a lead foil shield which allows a border of normal tissue about one-eighth inch wide to be exposed. A cone attached to the under side of a tube stand is then brought down so that it exerts firm pressure on the lead shield and covers the diseased area. The factors used are an 87 kilovolt 5 milliampere peak, a target skin distance of 10 inches, a filter of 0.5 mm. of aluminum and exposures of five minutes. With a Victoreen ionization apparatus placed so as to take back-scattering into account, this dose amounts to 555 roentgens with an aperture of three-fourths inch in diameter, 640 roentgens with an aperture of 1½ inches, and 666 roentgens with an aperture of 2 inches.

Roentgen Treatment over Vegetative Nerve Centers.—Langer reviews the literature and states that the effect of roentgen radiation on the vegetative nervous system was proved in animal experiments with a special technic by him in 1923 and that his observations have been corroborated by others. He explains the effect of roentgen radiation on the vegetative nervous system in a form of two stages: (1) irritating, (2) quieting effect. He reports three cases of different diseases of the skin illustrating these effects. He attempts to persuade radiologists to study and cooperate with his observations. He advocates the desirability of trying roentgen treatment before surgical removal of sympathetic ganglions or trunk resection. The technic presented might prove of value as a diagnostic test as well as a help in clinical research and does not seem to show any permanent injurious effect on the patient. It consists of the application of roentgen radiation either directly to the autonomic nerve center in the diencephalon or to other autonomic centers. All the cases have been treated with short wave therapy of from 185 to 200 kilovolts, 0.5 mm. of copper, 3 mm. of aluminum, 35 cm. skin target distance, wavelength 0.166 angstrom, and 4 milliamperes.

Injection of Iodized Poppy-Seed Oil into Knee Joint.—Burman and his associates injected iodized poppy-seed oil into the knee joints of thirteen patients. The age of the patients, six men and seven women, varied from 34 to 61. Twelve of the thirteen suffered from mild to severe arthritis of the knee over a period ranging from two months to three years. The thirteenth patient, a man, presented a bursitis under the insertion of the biceps femoris tendon and was used as a normal control joint. Only two cases showed marked bone changes roentgenographically, marked narrowing of the interarticular space with irregularity, indicating definite bony and cartilaginous destruction. In one case a sterile effusion of the knee was tapped, 40 cc. of a light brown fluid, with some fibrin in it, being obtained. Most patients complained of pain in and about the knee joint, swelling of moderate degree, and crepitation on motion. Motion was usually almost normal. In three cases, extension was slightly limited to 170 degrees and flexion was definitely lessened, even up to 90 degrees. Practically all cases showed enlargement of the infrapatellar fat pad and hypertrophy of the synovial membrane. In one case a foreign body was seen in the roentgenogram with definite limitation of motion. About three hours after the injection, all the patients were seized with severe, stabbing pains in the knee joint, radiating up the thigh and down the leg. Sleep was impossible. The acute pain lasted for about twelve hours and then gradually abated; in a duller, gradually lessening form, the pain persisted from two to eleven days. With the pain, the signs of a chemical synovitis of varying degree were noted—swelling of the joint, local heat, diffuse tenderness and refusal to move the joint because of pain and stiffness. No redness was present. The chemical synovitis, apart from the severity of the pain, lasted from one to two weeks. The authors conclude that the intra-articular injection of iodized poppy-seed oil is a dangerous procedure and that it should never be used.

American Review of Tuberculosis, New York

26: 637-792 (Dec.) 1932

Robert Koch's Discovery of Tubercle Bacillus: Some of Its Implications and Results. R. Philip, London, England.—p. 637.

*Statistical Estimation of Value of Program for Collapse Therapy. J. Head, Chicago; O. C. Schlack and J. Marx, Oak Forest, Ill. —p. 653.

Present Status of Chest Surgery in Treatment of Pulmonary Tuberculosis, with Especial Reference to Thoracoplasty. E. H. Bruns and J. Casper, Denver.—p. 665.

*Value and Limitations of Phrenicectomy in Advanced Pulmonary Tuberculosis: Report on One Hundred and Eighty-Three Cases. I. D. Bronfin and M. Chernyk, Denver.—p. 689.

Bilateral Artificial Pneumothorax. W. C. Pollock and H. P. Marvin, Denver.—p. 709.

Recording of Manometric Pressures in Artificial Pneumothorax. H. P. Bacon, Minneapolis.—p. 727.

Pulse Rate and Blood Pressure During Artificial Pneumothorax Insufflations. J. Steidl and F. H. Heise, New York.—p. 730.

Emphysema of Mediastinum as Complication of Artificial Pneumothorax. G. E. Ehrenburg, Spivak, Colo.—p. 738.

*Superiority of Mineral Oil over Olive Oil in Oleothorax: Experimental Studies. I. Goldenberg and S. I. Flanchik, Charkow, the Ukraine. Translated by Dr. Charles Rubenstein, Los Angeles.—p. 754.

*Cottonseed Oil in Progressively Obliterative Artificial Pneumothorax. N. Bethune, Montreal, Canada.—p. 763.

*Scaleniotomy in Treatment of Tuberculosis: Preliminary Report. M. Clyne, Tucson, Ariz.—p. 771.

Scaleniotomy as an Adjunct to Collapse Therapy. L. Fisher, Waverley Hills, Ky.—p. 776.

Value of Program for Collapse Therapy.—Head and his associates believe that phrenicectomy is of definite value as an independent procedure in the treatment of pulmonary tuberculosis. Its use as a primary procedure decreases the number of cases in which artificial pneumothorax is indicated. It discourages the development of extrapulmonary complications. Spread to the opposite lung, or a lighting up of arrested or quiescent processes there, is less likely to occur if the operation is performed. Active disease in the opposite lung is more likely to clear up. Phrenicectomy discourages the development of pleural adhesions and so does not interfere with the later induction of artificial pneumothorax if this should become necessary. It does not prevent collapse therapy of the opposite lung. In general, the percentage of favorable results is in proportion to the extent of involvement, the size of the cavities and the tendency to fibrosis and retraction of the lesion, but phrenicectomy frequently fails to effect cures in apparently favorable cases and often effects them in soft extensive lesions with large cavities and an absence of fibrosis. The authors wish to state that this program has been applied as an experiment and by no means expresses their conception of the proper treatment of tuberculosis. They feel that each tuberculous patient should be treated individually. Collapse therapy should be applied earlier and more frequently than it has been heretofore.

Value and Limitations of Phrenicectomy in Advanced Tuberculosis.—Bronfin and Chernyk give a tabulated report of the clinical results of phrenicectomy performed on 183 patients from 1924 to September, 1931. The extent of the pulmonary involvement or complication in each individual patient for which this operation was deemed advisable is indicated by group classification. From a study of the results they conclude that phrenicectomy is chiefly applicable in the treatment of predominantly unilateral lesions with little or no cavitation when pneumothorax is impossible and a routine sanatorium regimen is not productive of beneficial results. It has a wide field of usefulness in bilateral cases which have a limited contralateral lesion without definite cavitation. In from 40 to 50 per cent the palliative effect, decrease in cough and sputum and greater ease of expectoration, is quite marked. It may be an important aid in checking hemoptysis. It frequently converts an unsatisfactory pneumothorax into an effective collapse. It exerts a favorable influence on those complications so frequently resulting from pneumothorax, notably empyema either with or without bronchial fistula. Its usefulness in chronic lesions with bilateral cavitation, associated emphysema and general debility, even when there is a major disease on one side with recent lower lobe involvement, is extremely limited and it is generally contraindicated.

Superiority of Liquid Petrolatum over Olive Oil in Oleothorax.—Since Bernou made his first report on oleothorax in 1922, this method of therapy has been quickly adopted in tuberculosis clinics throughout the world. In the application of oleothorax in their clinic, Goldenberg and Flanchik observed through experimental work the action of olive oil and liquid petrolatum, without the addition of any disinfecting substances, on the healthy pleura of rabbits. Olive oil, as well as petrolatum, after being introduced into the pleural cavity produces an inflammatory reaction. This reaction is more marked when olive oil is used. Olive oil, even after being in the pleural cavity of a rabbit for a short time, undergoes marked physicochemical changes, whereas petrolatum undergoes changes only after a longer presence in the pleural cavity. The changes that take place in olive oil, and particularly petrolatum, while in the pleural cavity, and their general influence on the organism, warrant further detailed study. According to the data obtained by their experiments, the use of liquid petrolatum is preferable to olive oil in the field of oleothorax. The entire question requires further observation in the clinic, during which the differences noted in the reactions of the pleura of the human being against those of the experimental animal should be borne in mind.

Cottonseed Oil in Pneumothorax.—Bethune reports the case histories of three tuberculous patients in whom pure cottonseed oil appeared to be a useful substitute for air in progressively obliterative pneumothorax. The oil in these cases has been tolerated without local or constitutional reaction. The oil should not be used as a substitute for an ordinary pneumothorax, nor should it be placed on the diaphragm but only on the shelf formed by the adherent base of the lung. The rate of absorption of the oil will vary from 0.05 to 0.5 cc. a day. The author suggests that the use of the oil be restricted to semipermanent collapse and that it be drained after two or three years, as no case can be considered safe in which any foreign material—air, fluid or solid—is interposed between the two pleural surfaces. His technic of injection is as follows: The patient lies flat on his back. A 16 gage and an 18 gage needle are put into the pneumothorax cavity in the second interspace side by side. The pneumothorax pressures are taken; then the two needles are left open to the air. The sterile cottonseed oil is heated to body temperature in a water bath and injected with a 50 cc. Luer syringe through the 16 gage needle. After each 50 cc. injection the pressure of the remaining pneumothorax is taken with the manometer. It should show a zero or slightly negative pressure. The air is allowed to escape through the 18 gage needle as the oil is injected through the other. As soon as no true pressure can be obtained by the water manometer attached to the 18 gage needle, or as soon as oil appears in this needle, no more oil is injected. Both needles are withdrawn and the punctures tightly strapped. Fluoroscopy done immediately afterward will show the oil with a small apical cap of air on top of it. This cap of air will be absorbed in a few days, leaving the oil at a negative pressure. In testing the subsequent oil pressure, the author uses a U tube of 5 or 6 mm. internal diameter, filled with cottonseed oil. The scale is marked in true pressures of centimeters of oil, as on a water manometer. Owing to the specific gravity of oil being 0.9, corresponding oil pressures are nine tenths of water manometer pressures. With the patient sitting upright, a 16 gage needle is put in the lowest part of the oil pocket, and the oleomanometer, which is completely filled with oil, is connected with a short rubber tube to the needle and the pressure is read on the open limb.

Scaleniotomy in Treatment of Tuberculosis.—Clyne points out that phrenic exeresis should not be depended on alone in apical lung lesions but should be combined with scaleniotomy. Scaleniotomy alone has induced a degree of immobilization in the involved apex in a series of fifty-two cases. Of twenty cases in which a phrenic exeresis had been done from six months to three years previously and improvement had stopped, ten were improved and ten not improved; of twenty-nine cases in which the combined operation was done, improvement was noted in nineteen, with no improvement in ten; of three cases in which scaleniotomy was done alone, because of apical involvement with complicating asthma, and because it was thought best not to embarrass respiration by paralyzing the diaphragm, two were improved definitely. Scaleniotomy is indicated in pneumothorax cases with apical activity, when the upper lung has not been collapsed. Scaleniotomy and phrenic exeresis should in most cases precede a paravertebral thoracoplasty, because the first rib is released to allow greater caudal pull of the intercostal muscles, especially in front.

Archives of Dermatology and Syphilology, Chicago

26: 961-1176 (Dec.) 1932

Overlapping of Dermatology and Internal Medicine. W. H. Barrow, San Diego, Calif.—p. 961.
Microscopic Slide Precipitation Test for Diagnosis of Syphilis with Chancre Fluid: Including a Comparison of Kline, Wassermann, Kahn and Hinton Blood Serum Tests in One Hundred and Ten Patients with Suspected Syphilitic Sores. L. Chargin, J. J. Eller and C. R. Rein, New York.—p. 965.
Blood Sugar Findings in More Common Diseases of Skin: Report of Six Hundred Cases. J. E. Fisher, Cleveland.—p. 970.
Etiology of Pityriasis Rosea. L. W. Lord, Baltimore.—p. 981.
Pityriasis Lichenoides et Varioliformis Acuta: Report of Case. S. Crawford, Pittsburgh.—p. 990.
*Dermatologic Conditions of Fetus, with Particular Reference to Variola and Vaccinia. F. W. Lynch, Minneapolis.—p. 997.
Cutis Verticis Gyrata Following Trauma and Infection. H. E. Alderson, San Francisco.—p. 1020.
History of Feminine Beautification. C. Lerner, New York.—p. 1022.
Porokeratosis (Mibelli): Report of Case, Histologic Study and Animal Inoculation. E. B. Ritchie, Evansville, Ind., and S. W. Becker, Chicago.—p. 1032.
Dermatomyositis. P. H. Wheeler and M. Harbin, Cleveland.—p. 1039.
*Bowen's Precancerous Dermatosis and Multiple Benign Superficial Epithelioma: Evidence of Arsenic as an Etiologic Agent. N. P. Anderson, Los Angeles.—p. 1052.
*Nirvanol Eruptions. J. F. Madden, St. Paul.—p. 1065.
Efficacy of Bismarsen in Wassermann-Fast Syphilis. J. L. Grund, Boston.—p. 1074.
LXII. The Financing of Dermatologic Research: Suggestion for the Future. W. H. Mook. St. Louis.—p. 1076.
*Action of Pine Oil on Some Fungi of Skin, in Vitro. H. F. Smyth and H. F. Smyth, Jr., Wayne, Pa.—p. 1079.

Dermatologic Conditions of Fetus.—Lynch outlines the cutaneous diseases present at birth. He believes they are due to conditions related to fetal environment, ectodermal anomalies, keratoses, keratolyses, disturbances of subcutaneous tissue, nevus, new growths or infectious diseases. He reports a case of generalized eruption in a six months fetus born twenty-seven days after vaccination of the mother. The eruption consisted of umbilicated pustules and flaccid bullae. Similar cases have been described in the past as intra-uterine variola. An accurate diagnosis could have been established only by inoculation experiments with the fluid of the lesions. The history, appearance and pathologic studies were not sufficient to distinguish between these two possibilities. The author believes his case to be one of pemphigoid vaccinia occurring in the fetus.

Bowen's Precancerous Dermatosis.—Anderson reports a case of Bowen's disease presenting a history of arsenical medication, the presence of arsenic in the tissues and urine, the suggestive simultaneous occurrence of lesions that were clinically multiple benign superficial epithelioma, the presence of a cutaneous horn, the hyperkeratosic lesions on the legs, and the palmar and plantar arsenical keratoses. The author believes that one, and only one, etiologic agent can be responsible for such observations; namely, arsenic. He also reports two cases of benign superficial epithelioma, one multiple and the other single, both accompanied by arsenical keratoses of the palms and soles, in one of which arsenic was demonstrated in the lesion. He discusses the probable relationship of Bowen's disease to multiple benign epithelioma and suggests that arsenic is the etiologic agent in both conditions.

Nirvanol Eruptions.—Madden points out that nirvanol, a new preparation used in the treatment of chorea, after it has been administered for a definite time in exact amounts, uniformly produces an eruption accompanied by a definite symptom complex. In chorea, successful results are attributed to the specific reaction that occurs after several days of oral administration. Most observers believe that the reaction is similar to that of serum sickness, but the exact mechanism is not known. Symptoms following ingestion of nirvanol appear with clocklike precision. They are not constant but are more consistent than is the case with most eruptions due to drugs. The histopathologic condition is the same as that found in any toxic erythema. The differential diagnosis rests between the acute contagious exanthems, measles and scarlet fever, and eruptions produced by this drug. There are fairly uniform changes in the blood in all cases. The prognosis of nirvanol sickness is good. Complications are few and usually are of no great consequence. The literature contains only a few examples of severe complications that resulted in sepsis or death.

Action of Pine Oil on Some Fungi of Skin.—On the basis of their tests, the Smyths state that pine oil has definite value as a fungicide against organisms causing such diseases of the skin as ringworm. Considering cost and effectiveness, "very pale yellow" pine oil seems to be the most practical of the materials tested, although it is not the best material for every organism tested. One advantage of pine oil over other possible materials for the treatment of ringworm lies in its low vapor pressure. It stays in contact with the infection for a long time. Two or three applications daily are adequate to maintain almost constant contact, even without poulticing. This is by no means true of all materials now on the market for the treatment of ringworm. For treatment of fungal infections in which the organism burrows under the top layers of the skin, this long continued contact with chance for penetration is a decided advantage. The odor of pine oil is pleasant and it does not stain or otherwise injure clothing, so that its use is not objectionable.

Archives of Neurology and Psychiatry, Chicago

28: 1243-1478 (Dec.) 1932

Cerebral Circulation: XIX. Vagal Pathway of Vasodilator Impulses. S. Cobb and J. E. Finesinger, Boston.—p. 1243.
Cerebral Vasodilatory Nerves and Their Pathway from Medulla Oblongata: Observations on Pial and Intracerebral Vascular Plexus. J. Chorobski and W. Penfield, Montreal, Canada.—p. 1257.
*Cerebral Circulation: XVIII. Effect of Caffeine on Cerebral Vessels. J. E. Finesinger, Boston.—p. 1290.
Encephalography: Anatomic and Clinical Correlations. H. H. Dixon, Portland, Ore., and F. G. Ebaugh, Denver.—p. 1326.
*Relation Between Myasthenia Gravis and Exophthalmic Goiter. S. J. Cohen and F. H. King, Brooklyn.—p. 1338.
Oxygen Consumption ("Basal Metabolic Rate") in Schizophrenia: II. Distribution in Two Hundred and Fourteen Cases. R. G. Hoskins, with technical assistance of Anna Walsh, Boston.—p. 1346.
Development of Behavior Patterns and Myelinization of Tracts in Nervous System. O. R. Langworthy, Baltimore.—p. 1365.
*Effect of Experimental Hepatic Damage on Hemato-Encephalic Barrier. C. W. Eisele and L. A. Crandall, Jr., Chicago.—p. 1383.
Charles Karsner Mills: Memorial Meeting of Philadelphia Neurological Society. C. H. Frazier, W. G. Spiller, C. W. Burr, J. W. McConnell and W. B. Cadwalader, Philadelphia.—p. 1390.

Cerebral Circulation.—Finesinger describes experiments in which he demonstrated that during amytal anesthesia the intravenous administration of caffeine sodiobenzoate to cats caused a dilatation of the pial artery, a rise in cerebrospinal fluid pressure and an abrupt drop in blood pressure with immediate return to normal. Local administration of caffeine solution to the pia caused a dilatation of the pial artery and in most cases no change in cerebrospinal fluid pressure or blood pressure. During ether anesthesia the intravenous administration of caffeine caused a constriction of the pial artery from its initial diameter, a drop in cerebrospinal fluid pressure and an abrupt drop in blood pressure with return to normal. After local administration, during ether anesthesia, caffeine had no effect on the pial artery and in most cases caused no change in the cerebrospinal fluid pressure and blood pressure. After recovery from ether anesthesia, when the superficial reflexes were present, the intravenous administration of caffeine caused an acute constriction of the pial artery followed in most cases by an immediate dilatation. In most cases the cerebrospinal fluid pressure dropped and then rose immediately. The blood pressure dropped abruptly and then immediately rose to its normal level, and in most cases exceeded its preliminary level. During amytal anesthesia and after recovery from ether anesthesia there was evidence of dilatation of the measurable arteries, arterioles and venules. Changes in velocity and color were observed, which indicate that the caffeine caused a dilatation of the capillaries as well. The results presented by the author are in keeping with the results of most investigators studying the vascular response to caffeine in other parts of the body. This would suggest that the vessels of the pia respond to caffeine in the same way as do the vessels elsewhere in the body.

Myasthenia Gravis and Exophthalmic Goiter.—Cohen and King report a case of exophthalmic goiter with myasthenia gravis. They also review the heretofore reported cases of exophthalmic goiter with myasthenia gravis. The cases of the combination of myasthenia gravis with exophthalmic goiter do not exhibit lesions of the brain or of the spinal cord. There is a similarity in the pathology, pathogenesis and endocrine dysfunction in exophthalmic goiter and myasthenia gravis. The authors call attention to the beneficial effect of ephedrine sulphate in myasthenia gravis alone, as well as when it is complicated by exophthalmic goiter.

Experimental Hepatic Damage. — Eisele and Crandall studied the hemato-encephalic barrier in thirty-seven normal dogs, eight dogs with Eck fistulas and two with complete obstructive jaundice. The methods used were the appearance of dyes in the cerebrospinal fluid, Walter's bromide method and the inorganic phosphorus of the fluid. No evidence of a change in barrier function in the presence of liver damage was found. The permeability quotient for bromide is higher and more variable in normal dogs than in normal men. Varying the duration of bromide feeding from two to ten days did not have any apparent effect on the quotient.

Arch. of Physical Therapy, X-Ray, Radium, Chicago

13: 710-794 (Dec.) 1932

Therapeutic Applications of High Frequency Currents. d'Arsonval, Nogent-sur-Marne, France.—p. 715.
Professor d'Arsonval. G. Bourguignon, Paris, France.—p. 717.
D'Arsonvalization: Its Principal Applications. L. Delherm and M. Kahn, Paris, France.—p. 727.
D'Arsonval and His Work. H. Bordier, Lyons, France.—p. 734.
High Frequency and Blood Pressure. A. Laqueur, Berlin, Germany. —p. 740.
The Landmarks of Electrotherapy. W. J. Turrell, Oxford, England. —p. 744.
Present Status of Electropyrexia. C. A. Neymann, S. M. Feinberg, D. E. Markson and S. L. Osborne, Chicago.—p. 749.
High Lights in Electrosurgery. H. A. Kelly, Baltimore.—p. 768.
Treatment of Malignant Growths of Oral Cavity. W. L. Clark, Philadelphia.—p. 771.
Further Considerations of Diathermy in Malignancy. G. Kolischer, Chicago.—p. 780.
Diathermy in Gynecology. E. P. Cumberbatch, London, England. —p. 782.
D'Arsonvalization in Hyperpiesis. F. H. Humphris, London, England. —p. 786.
Electrosurgical Tonsillectomy: Its Scientific Status in Laryngology. A. R. Hollender, Chicago.—p. 789.

Delaware State Medical Journal, Wilmington

4: 265-288 (Dec.) 1932

Asiatic Cholera in Wilmington: 1832. W. P. Frank, Wilmington. —p. 265.
Social Insurance. E. H. Ochsner, Chicago.—p. 277.

Iowa State Medical Society Journal, Des Moines

22: 563-624 (Dec.) 1932

*Value of Electrocardiograph in Differential Diagnosis of Heart Disease. L. E. Cooley, Dubuque.—p. 563.
Problem of Mental Defectiveness in Iowa. A. H. Woods, Iowa City. —p. 569.
Clinical Neurology and General Practitioner. T. B. Throckmorton, Des Moines.—p. 574.
Indications for Sympathectomy in Angina Pectoris. W. D. Abbott, Des Moines.—p. 581.
Psychoses Associated with Pregnancy. R. E. Crowder, Sioux City. —p. 583.
Present Status of Treatment of Syphilis in Adults. C. C. Collester, Spencer.—p. 585.
Severe and Neglected Syphilis: Case. Mary H. Swan, Chicago.—p. 592.

Electrocardiograph in Differential Diagnosis of Heart Disease.—Cooley points out that a normal electrocardiogram does not necessarily mean a normal heart. Myocardial involvement may be interpreted as myocardial damage only in conjunction with the clinical picture. The amount of myocardial involvement may not correspond to what is seen in the electrocardiogram. One cannot determine whether the involvement is acute or chronic from the electrocardiogram. Physiologic changes can easily be confused with minor changes in the QRS and T waves. Digitalis can produce changes in the QRS and especially in the T wave which can be mistaken for myocardial involvement. It is not possible to make a diagnosis of valvular disease from the electrocardiogram. Like all other mechanical means in medicine, it is only an aid in making the diagnosis. Nevertheless, it is invaluable in many cases. There is a decided practical advantage in differentiating the irregularities of the heart. The prognosis of extrasystoles, as a rule, is much better than that of auricular fibrillation. Extrasystoles from one focus are less dangerous than those from several foci. Auricular fibrillation is a serious heart condition, while sinus arrhythmia is a physiologic variation. To give digitalis or quinidine to a patient with partial heart block is dangerous, but it is good treatment in auricular fibrillation. The simple tachycardias have a better outlook than the paroxysmal tachycardias. Quinidine is not indicated in the simple tachycardias but it may be in the paroxysmal tachycardias. The outlook in a sinus bradycardia is obviously much better than in partial or complete heart block. An electrocardiogram may be of value after thyroidectomy in differentiating hyperthyroidism from myxedema. Finally, in the treatment of heart cases the electrocardiogram is essential. It is a valuable aid in digitalization. The appearance of an inverted T wave, extrasystoles or a partial heart block indicates that a digitalis effect is being obtained. The electrocardiogram also serves as a guide in preventing overdosage of such drugs as digitalis and quinidine.

Journal of Comparative Neurology, Philadelphia

56: 257-512 (Dec. 15) 1932

Diencephalic Course and Termination of Medial Lemniscus and Brachium Conjunctivum. S. W. Ranson and W. R. Ingram, Chicago. —p. 257.
Spinal Cord Regeneration in Young Rainbow Fish, Lebistes Reticulatus. D. Hooker, Pittsburgh.—p. 277.
Cerebellum of Reptiles: Chelonians and Alligator. O. Larsell, Portland, Ore.—p. 299.
Electrodynamic Theory of Development Suggested by Studies of Proliferation Rates in Brain of Amblystoma. H. S. Burr, Boston.—p. 347.
Experiments on Motor Cortex of Cat. P. S. McKibben and D. R. Wheelis, San Francisco.—p. 373.
Spongioblastomas of Brain. P. Bailey, Chicago, and Louise Eisenhardt, Boston.—p. 391.
"Law" of Cephalocaudal Differential Growth in Its Application to Nervous System. B. F. Kingsbury, Ithaca, N. Y.—p. 431.
Further Experiments on Accelerated Growth in Heteroplastic Spinal Cord Grafts. S. R. Detwiler, New York.—p. 465.
Biologic Theories of Gottfried Reinhold Treviranus (1776-1837). R. Mourgue, Mulhouse, France.—p. 503.

Journal of Immunology, Baltimore

23: 423-497 (Dec.) 1932

Hypothetic Mechanism of Antibody Formation. S. Mudd, Philadelphia. —p. 423.
Phenomenon of Local Skin Reactivity to Pneumococcus. G. Shwartzman, New York.—p. 429.
Quantitative Study of Precipitin Reaction, with Especial Reference to Crystalline Egg Albumin and Its Antibody. J. T. Culbertson, New York.—p. 439.
*Specific Reaction of Convalescent Serum on Streptococcus Isolated in Studies of Poliomyelitis. E. C. Rosenow, Rochester, Minn.—p. 455.
Quantitative Aspect of Hypothetic Incorporation of Injected Antigen in Resulting Antibody: II. Experimental. S. B. Hooker and W. C. Boyd, Boston.—p. 465.
Further Studies on Meningococcus, with Especial Reference to Shwartzman Reaction. H. W. Powell and W. A. Jamieson, Indianapolis. —p. 481.

Specific Reaction of Convalescent Serum on Streptococcus Isolated in Poliomyelitis. — Rosenow found, by studying the effect of convalescent serum on the streptococcus having characteristic cataphoretic velocity as isolated in cases of poliomyelitis, a marked and specific slowing or charge-reducing effect. This action of the serum increases during recovery from poliomyelitis and is at its maximum during the fourth week after onset of the acute attack, after which there is gradual diminution, but it remains readily demonstrable even twenty years after recovery. The results indicate that the streptococcus isolated by him so consistently in poliomyelitis is not a contamination or postmortem invader.

Journal of Lab. and Clinical Medicine, St. Louis

18: 219-328 (Dec.) 1932

Classification of Allergic Diseases, with Reference to Diagnosis and Treatment. A. F. Coca, Pearl River, N. Y.—p. 219.
A-V Dissociation. E. B. Zeisler, Chicago.—p. 225.
Control of Pollen Allergy. W. T. Vaughan, Richmond, Va.—p. 240.
*Observations on Accuracy of Rabbit Ovulation Test for Pregnancy. H. H. Ware, Jr., and R. J. Main, Richmond, Va.—p. 254.
*Sedimentation Rates of Erythrocytes in General Disease. D. M. Vickers and Ruth Duryee, Cambridge, N. Y.—p. 260.
Studies in Venous Pressure. L. B. Owens, Cincinnati.—p. 266.
Specific Gravity of Blood During Spinal Anesthesia. T. Bender and D. Polowe, Paterson, N. J.—p. 275.
Etiologic Studies in Hodgkin's Disease. H. L. Stewart, Philadelphia. —p. 281.
*Effects Observed Following Intravenous and Subcutaneous Administration of Fluid: Experimental Study on Dogs. J. R. Miller and C. A. Poindexter, Chicago.—p. 287.

Rabbit Ovulation Test for Pregnancy.—Ware and Main tested 150 patients for suspected pregnancy with the rabbit ovulation test, and later established the diagnosis clinically in 100 of these. This test has proved to be accurate with but one possible exception. The number of cases now reported in the literature is over 1,000, with an accuracy of over 99 per cent. The authors found the rabbit ovulation test to be of particular

advantage in the diagnosis of hydatidiform mole, missed abortion, ectopic pregnancies, uterine fibroids, the menopause and tubo-ovarian abscesses. The earliest pregnancy giving a positive result was six days after the menstrual period was due. Following delivery, a negative result was obtained in from twenty-four to seventy-two hours.

Sedimentation Rates of Erythrocytes. — Vickers and Duryee state that the test for determining the red cell sedimentation rate is easily performed and that the results are easily read. Normal persons have a sedimentation time (Linzenmeier method) of over two hours. Severe acute and chronic inflammatory conditions greatly lower this time. The authors employed the test in 348 patients suffering from numerous complaints. They conclude that it is of diagnostic and prognostic value in rheumatic fever, atrophic arthritis and osteoarthritis and in differentiating mild degrees of these conditions from functional disturbances symptomatically similar. The test is also of value in separating inflammatory from noninflammatory conditions of the urinary tract and is of considerable confirmatory evidence in many other conditions.

Intravenous and Subcutaneous Administration of Fluid. —Miller and Poindexter observed that no harmful results were demonstrated when large quantities of a 0.9 per cent solution of sodium chloride were given, either subcutaneously or intravenously, to normal or pathologic animals. Electrocardiograms did not show any characteristic changes when large quantities of fluids were given intravenously either in normal animals or in those presumably suffering from myocardial damage. Isotonic saline solution, when injected subcutaneously, decreased the amplitude of the R wave in the electrocardiogram. In normal animals, exsanguination and perfusion gave blood volumes that corresponded closely to those given by the dye method. There was an increased concentration of the blood in animals suffering from the effect of diphtheria toxin. The blood volumes, as determined by the dye method, showed no increase after the intravenous injection of large amounts of fluid. This did not agree with the amount indicated by the dilution of the blood, as shown by repeated determinations of the erythrocytes, hemoglobin, serum proteins and plasma increase. No index was found that might be used as a warning against excessive hydration of the tissues. The authors believe that the hematocrit is the most simple test for blood dilution following the administration of fluids postoperatively. Its use would be limited, obviously, to cases not manifesting hemorrhage or evidence of rapid hemolysis.

Journal of Pharmacology & Exper. Therap., Baltimore

46: 375-492 (Dec.) 1932

Pharmacologic Action of Eseridine. R. St. A. Heathcote, Cairo, Egypt. —p. 375.
*Concerning Relative Preanesthetic Values of Sodium Salts of Isoamylethylbarbituric Acid (Amytal), Pentobarbital, Phenobarbital and Barbital. E. E. Swanson, Indianapolis.—p. 387.
Studies on Synergism and Antagonism of Drugs: I. Nonparasympathetic Antagonism Between Atropine and Miotic Alkaloids. T. Koppanyi, Washington, D. C.—p. 395.
Vagus Control of Pancreatic Function: Experimental Insulin Resistance. E. B. Boldyreff and Jean F. Stewart, Battle Creek, Mich.—p. 407.
*Study of Gastric Secretion Caused by Insulin. E. B. Boldyreff and Jean F. Stewart, Battle Creek, Mich.—p. 419.
*Use of Basic Sodium Phosphate as Antidote for Hypercalcemia in Dogs. Irvine H. Page and J. P. Scott, Indianapolis.—p. 431.
Response of Isolated Intestine to Cocaine and Novocain at Different p_H Levels. W. Salant and W. M. Parkins, Cold Spring Harbor, N. Y.—p. 435.
Cardiovascular and Metabolic Reactions of Man to Intramuscular Injection of Posterior Pituitary Liquid (Pituitrin), Pitressin and Pitocin. A. Grollman and E. M. K. Geiling, Baltimore.—p. 447.
Action of Various Uric Acid Eliminants on Experimental Uric Acid Storage in Kidney. H. O. Schroeder, Montreal, Canada.—p. 461.
Method for Studying Variations in Coronary Inflow During Series of Cardiac Cycles, or for Determining Inflow Rates Generally. R. L. Stehle, Montreal, Canada.—p. 471.
Influence of Heart Beat on Flow of Blood into Coronary Arteries. R. L. Stehle and K. I. Melville, Montreal, Canada.—p. 477.

Barbituric Acid Derivatives.—By different methods of comparison, Swanson found that sodium amytal and sodium pentobarbital have practically the same premedication value. Sodium phenobarbital and sodium barbital possess a comparatively lower hypnotic efficiency. The author emphasizes that the toxicity of these compounds should be accurately determined before any comparisons are made with the methods employed.

Gastric Secretion Caused by Insulin.—Boldyreff and Stewart report that both commercial and crystalline preparations of insulin have a definite secretagogue action on gastric glands. The latent period depends on the mode of administration: ten minutes or less for intravenous and about forty minutes for subcutaneous injection. The duration of secretion depends on the dosage, lasting from one to six hours (2 to 8 units of insulin). The stimulating action is monophasic and is not preceded by a period of inhibition of gastric secretion. Small dosages are found to be effective (2 units). Gastric juice secreted in response to insulin has a high acidity, free and total, and high pepsin content. The acidity, determined electrometrically, may attain a p_H of 1.0 or even slightly less. It is not improbable that the polypeptide nature of insulin is responsible for its action on the stomach. Gastric secretion caused by this drug, unlike that produced by histamine, is suppressed by the administration of atropine. It is therefore apparent that the secretagogue action of insulin is due to vagus stimulation of the stomach. Intravenous administration of dextrose does not suppress gastric secretion produced by insulin. The beginning of gastric secretion precedes the advent of hypoglycemia. The greatest diminution in the amount of blood sugar occurs a considerable time after the onset of secretion.

Basic Sodium Phosphate as Antidote in Hypercalcemia.—Page and Scott describe experiments in which they noted that basic sodium phosphate intravenously injected into normal dogs and dogs in which the calcium has been raised by parathyroid extract lowered the serum calcium. Though by no means ideal, this salt is a fairly effective antidote for hyperparathyroidism.

Missouri State Medical Assn. Journal, St. Louis

29: 551-608 (Dec.) 1932

*Hunger Osteomalacia: Report of Case—Recovery. C. H. Eyermann, St. Louis.—p. 551.
Clinical Manifestations of Diseases of Breast. J. N. Jackson, Kansas City.—p. 555.
Roentgen Ray Examination of Breast. I. H. Lockwood and W. Stewart, Kansas City.—p. 557.
*Respiratory Diseases that Mimic Appendicitis: Their Importance to Surgeon. P. S. Lowenstein, St. Louis.—p. 563.
Prognosis and Treatment of Syphilitic Aortitis. W. S. Middleton, Madison, Wis.—p. 567.
Syphilis of Nervous System. S. I. Schwab, St. Louis.—p. 574.
Syphilis of Osseous System. A. O'Reilly, St. Louis.—p. 577.
Effect of Malarial Therapy on the Congenital Syphilitic. C. C. Dennie, Kansas City.—p. 581.
Presence of Syphilis in Compensation Claims as Viewed by Missouri Workmen's Compensation Commission. J. J. James, Kansas City.—p. 585.
Presence of Syphilis in Compensation Cases from Standpoint of Physician. P. F. Stookey, Kansas City.—p. 587.

Hunger Osteomalacia. — Eyermann says that during the year 1918 there occurred in Austria and Germany an affliction characterized by pain in the bones which was usually interpreted as rheumatism. The pains were most frequently present in the ribs, back and lower extremities. With progression of the affliction there ensued difficulty in climbing stairs, a characteristic waddling gait and loss of stature. Eventually the sufferers became bedfast, being able to move only with assistance and then with great pain. Deformity as a rule was confined to kyphoscoliosis of the spine, but spontaneous fractures were not infrequent. The bones of the pelvis were seldom involved. The disease occurred chiefly among the poorest classes. The diets of these patients consisted mainly of vegetables and bread with small amounts of flour and sugar. Milk, butter, eggs and meat were unobtainable and a small amount of lard was the only fat. It occurred especially in people past middle age (from 40 to 70) and had nearly an equal distribution between the sexes. There was a greater incidence of cases during the winter. The author reports the case of a man, aged 59, confined to bed for one year because of bone pains, and coinciding in all particulars with the symptom complex of hunger osteomalacia, who recovered completely on a high calcium and phosphorus intake combined with cod liver oil and direct exposure to sunlight.

Respiratory Diseases that Mimic Appendicitis.—Lowenstein believes that emphasis should be placed on the tendency of infections of the upper respiratory tract to cause symptoms closely mimicking acute appendicitis, and, while at times there seems to be a causal sequence between inflammation in the

nasopharynx and the appendix, in many instances microscopic study of the latter proves the condition to be merely a lymphoid hyperplasia. The keynote of the whole subject is to place more dependence on the physical signs as evolved from a careful examination of the patient, and less on the variable and often evanescent symptoms.

New England Journal of Medicine, Boston

207: 963-1012 (Dec. 1) 1932

Experiences with Encephalography. C. D. Branch, Cleveland; E. C. Cutler and R. Zollinger, Boston.—p. 963.
Economics of Massachusetts Cancer Program. G. H. Bigelow and H. L. Lombard, Boston.—p. 972.
Chronic Progressive Chorea: Huntington's Disease. S. Stone, Concord, N. H.—p. 974.
First Sectarian Medical School in New England, at Worcester (1846-1859), and Its Relation to Thomsonianism. F. C. Waite, Cleveland.—p. 984.

207: 1013-1068 (Dec. 8) 1932

*Carcinoma of Esophagus: Analysis of Sixty-One Cases. L. R. Gaetan, Madrid, Spain, and E. S. Emery, Jr., Boston.—p. 1013.
Studies in Fat Metabolism: V. Observations in Lipids and Phosphorus Compounds of Human Bile. C. W. McClure, Mildred E. Huntsinger and Alison T. Fernald, Boston.—p. 1015.
Paroxysmal Hemoglobinuria: Report of Cases, with Familial Findings. F. P. McCarthy and R. Wilson, Jr., Rochester, Minn.—p. 1019.

Carcinoma of Esophagus.—Gaetan and Emery present an analysis of sixty-one cases of carcinoma of the esophagus, in all of which the disease was advanced by the time a diagnosis was made. No symptoms were found that could be recognized as early manifestations of the disease, although dysphagia was the first symptom in twenty-five patients and pain in twenty-two. The authors believe that, since these symptoms are not characteristic, one should use both roentgen examination and the esophagoscope if one hopes to make an early diagnosis. In the later stages a typical history of gradually increasing obstruction may develop, but this was present in only 58 per cent of the patients. A typical history is so diagnostic that it is usually safe to make a tentative diagnosis of carcinoma even though it is not confirmed by roentgen examination or the esophagoscope.

Pennsylvania Medical Journal, Harrisburg

36: 157-230 (Dec.) 1932

Changing Concepts in Treatment of Peptic Ulcer. F. H. Lahey, Boston.—p. 157.
Irradiated Substances in Treatment of Skin Diseases. J. B. Ludy, Philadelphia, and C. M. DeValin, Washington, D. C.—p. 165.
Problem of Cardiac Child: In the Clinic, the School and the Home. V. T. Curtin, Philadelphia.—p. 168.
Value of Internal Urinary Antiseptics. M. Trumper, Philadelphia.—p. 171.
Serum Treatment of Gas Gangrene: Report of Ten Cases. W. E. Burnett, Philadelphia.—p. 174.
Symposium on Surgery of Colon: Operative Treatment of Diseases of Colon. M. Behrend, Philadelphia.—p. 177.
*Id.: Symptoms and Diagnosis of Carcinoma of Colon: New Method for Extirpating Rectosigmoid. W. W. Babcock, Philadelphia.—p. 180.
Barraquer Clinic in Barcelona, Spain. W. J. Harrison, Philadelphia.—p. 186.
Medicolegal Aspects of Drunkenness. H. A. Heise and B. Halporn, Uniontown.—p. 190.

Carcinoma of Colon.—Babcock states that cancer of the colon, properly handled, gives a better prognosis than cancer of any other part of the gastro-intestinal tract. By eliminating abdominal colostomy, inversion of the rectum, stage operations, and retention of segments of the distal bowel and of the artificial peritoneal diaphragm formed at the brim of the pelvis, he has greatly reduced the dangers of peritoneal infection and intestinal obstruction. In the author's method, the bowel is not entered or sutured until the abdomen has been closed and an occlusive dressing applied to all wounds. In operating, he pays attention to the distribution of lymphatics in the rectum and sigmoid as emphasized by Miles. He opens the abdomen through a vertical left rectus incision. After carefully examining the liver, the aortic lymph nodes and the peritoneum for possible metastasis, he divides the left leaf of the mesosigmoid and separates the attached fat and lymphatics from the underlying structures to the midline. On the right side, he divides the peritoneum along the brim of the pelvis, locates and divides the inferior mesenteric or the superior hemorrhoidal vessels between ligatures and, if necessary, ligates and divides one or more of the sigmoid vessels. He then carries the incision along the anterior margin of the pelvis posterior to the bladder, dividing the peritoneum well distant from the diseased intestine and the sigmoid, and separating rectum with fat lymphatics to the floor of the pelvis. This leaves the iliac vessels, ureters and spermatic vessels exposed. He ties a tape of folded iodoform gauze about 2 inches wide and 2 yards long at least 4 inches above the tumor. He carries the ends of the tape back of the rectum to the floor of the pelvis, against which they are firmly packed. The tumor and liberated intestine are laid on the gauze and the abdomen is immediately closed without drainage. He then places the patient in the lithotomy position, closes the rectum by a strong purse string suture, and makes an incision through the pelvic floor in the midline from near the posterior margin of the anus to the left side of the coccyx. Through this incision, the mass of gauze packing is located. He introduces a gauze drain into the pelvis to the right of the withdrawn intestine and, with the protection of a gauze dressing over the perineal wound, cuts the loop of diseased intestine away and ties a large rectal tube into the proximal end. He then introduces a retention catheter and returns the patient to bed. At a later stage, an anastomotic operation to unite the sigmoid to the lower end of the anal ring may be attempted or in some patients the proximal end of the sigmoid may be pulled through the dilated and split anus at the completion of the first stage of the operation. He has also used this operation for diverticulitis to avoid the dangers of an intra-abdominal or stage anastomosis. For comfort the patient should see that the lower intestine is completely emptied every twenty-four or forty-eight hours. He concludes that in about thirty cases this operation gave a mortality of about 10 per cent, which may be reduced to 3 per cent if deaths not directly due to the operation are eliminated.

Psychoanalytic Quarterly, Albany, N. Y.

1: 375-772 (Oct.) 1932

Bioanalysis of the Epileptic Reaction. A. Kardiner, New York.—p. 375.
Female Homosexuality. Helene Deutsch, Vienna, Austria.—p. 484.
Ego Feeling in Dreams. P. Federn, Vienna, Austria.—p. 511.
Note on Theory of Libidinal Types. D. Feigenbaum, New York.—p. 543.
Outline of Clinical Psychoanalysis. O. Fenichel, Berlin, Germany.—p. 545.
Maurice Bedel's "Jerome"—A Study of Contrasting Types. J. C. Flügel, London, England.—p. 653.
The Paths of Natural Science in the Light of Psychoanalysis. S. Radó, New York.—p. 683.
Causality and Psychoanalysis: A Letter to Editors of the Psychoanalytic Quarterly. M. Reiner, Easton, Pa.—p. 701.
An Autobiographic Critique. F. Dell, Croton-on-Hudson, N. Y.—p. 715.

South Carolina Medical Assn. Journal, Greenville

28: 291-326 (Dec.) 1932

Friedman Test for Pregnancy. F. B. Johnson and Eleanor W. Townsend, Charleston.—p. 296.
Malignancies of Large Bowel. G. T. Tyler, Jr., Greenville.—p. 300.
Rivanol Lactate, as Satisfactory Treatment in Puerperal Septicemia. B. J. Workman, Woodruff.—p. 304.
Cytologic Basis for Certain Functional States. W. deB. MacNider, Chapel Hill, N. C.—p. 306.

Texas State Journal of Medicine, Fort Worth

28: 509-582 (Dec.) 1932

Diagnosis and Treatment of Carcinoma of Colon, with Especial Reference to Method of Perineal Colostomy. W. W. Babcock, Philadelphia.—p. 515.
Referred Abdominal Pain. T. H. Thomason, Fort Worth.—p. 519.
Adenoma of Islet Cells of Pancreas with Hyperinsulinism, Hypoglycemia, Operation and Recovery. J. S. Tomkies, Dallas.—p. 523.
Consideration of Low Basal Metabolic Rate in So-Called Spastic Colitis. M. D. Levy, Houston.—p. 526.
Painful Breasts: A Gynecologic Problem. E. W. Bertner, Houston.—p. 528.
Complete Anesthesia in Obstetrics with Use of Quinine Intravenously. Grace Humphreys Hood, Fort Worth.—p. 531.
Cistern Puncture in Diagnosis and Treatment of Syphilis. E. C. Fox, Dallas.—p. 534.
Tumors of Ovary. H. R. Dudgeon, Waco.—p. 536.
Obstruction of Lower End of Esophagus. R. P. O'Bannon, Fort Worth.—p. 539.
Infant Feeding, with Especial Reference to Some of Its Problems During First Year. L. von Meysenbug, New Orleans.—p. 543.
Use of Glucose Solutions in Treatment of Infants and Children. D. Greer, Houston.—p. 548.
Medical and Surgical Treatment of Squint. J. H. Burleson and J. B. Moore, San Antonio.—p. 550.
Treatment of Sinus Diseases in Adults: General Considerations. R. E. Parrish, San Antonio.—p. 553.
Needed Public Health Legislation. J. W. E. H. Beck, De Kalb.—p. 557.
The Inadequacy of Medical Socialism. W. F. Starley, Galveston.—p. 559.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Anaesthesia, Manchester

10: 1-46 (Oct.) 1932

Choice of Anesthetic for Abdominal Surgery. H. Finsterer.—p. 3.
Notes of Anesthesia in Thoracic Surgery. J. R. Mackenzie.—p. 19.
*Three Hundred Cases of Routine Spinal Anesthesia. G. A. B. Walters.—p. 25.
*Comments on Use of Percaine as Spinal Anesthetic. E. F. Johnson.—p. 35.

Routine Spinal Anesthesia.—In using spinal anesthesia, Walters gives morphine hypodermically half an hour before the time of the operation. He places the patient in the left lateral position. He selects the space between the second and third lumbar vertebrae and injects a solution of ephedrine and procaine hydrochloride at the chosen site, infiltrating the path of the needle down to the theca. The ephedrine combats the fall in blood pressure and the procaine renders the actual puncture practically painless. From his observations in 300 cases of routine spinal anesthesia he draws attention to the following points: 1. No serious disadvantage was found in using spinal anesthesia as a routine in the 300 cases. 2. The anesthetic can be repeated without danger. 3. A smaller dose should be given to patients suffering from toxic absorption. 4. In emergency operations on patients not specially prepared, there is less vomiting than after general anesthesia. 5. By the simple method described, a comparatively short duration of anesthesia can be obtained, which makes possible the adoption of the Fowler position soon after the patient is in the ward. 6. The remarkable diminution of postoperative shock after spinal anesthesia has long been recognized; but the well being of the patients, and the air of peace in a surgical ward on "list" days, following the use of this anesthetic as a routine, have yet to be fully appreciated. 7. Spinal anesthesia does not prove an effectual preventive against such postoperative complications as pneumonia and paralytic ileus.

Nupercaine as Spinal Anesthetic.—Johnson has administered nupercaine as a spinal anesthetic for the past twelve months, employing the method originated by Jones and described by him. The advantages he claims for it are: (1) the complete degree of anesthesia obtained; (2) the admirable muscular relaxation obtained; (3) the avoidance of primary surgical shock, due presumably to the blocking of afferent impulses at the spinal nerve roots; (4) the slight and transient fall in blood pressure that follows its administration; (5) the absence of untoward after-effects. In his series of sixty patients, only two have suffered from spinal headache. The occurrence of these headaches seems to be minimized by the use of a small bore (1.1 mm.) spinal needle, thereby reducing the liability of subsequent leakage of the cerebrospinal fluid through the hole pierced in the spinal theca. No patient in the series suffered from any form of subsequent paralysis. He concludes that spinal nupercaine appears to be particularly indicated in operations below the diaphragm when some general complication such as lung trouble or diabetes exists, or when the operation may be expected to be lengthy or productive of considerable shock.

British Journal of Radiology, London

5: 865-928 (Dec.) 1932

Influence of Muscular Work on Movements of Stomach: Part II. Experiments on Man. T. W. Adams, D. J. Clarke, J. M. Lees, M. S. Pembrey and R. S. Vine.—p. 869.
Output of Various Types of X-Ray Machines and the Influence of Wave Form on Quality of Roentgen Radiation. C. E. Eddy.—p. 892.
Ancient History. J. R. Riddell.—p. 903.

British Journal of Tuberculosis, London

27: 1-50 (Jan.) 1933

Preventive Vaccination Against Tuberculosis with B C G, as Practiced by Doctors in Their Own Families. A. Calmette.—p. 1.
Some Observations on Venous Puncture in Pulmonary Tuberculosis. H. Roche.—p. 7.
Cavitation in Pulmonary Tuberculosis. R. C. Wingfield.—p. 10.
Causal Factors in Development of Pulmonary Tuberculosis. J. Watt.—p. 13.
Blood Pressure in Tuberculosis. J. Johnstone.—p. 16.
Work of Tuberculosis Care Committees. Margaret Talbot Kelly.—p. 19.
Impression of Eighteenth Annual Conference of National Association for Prevention of Tuberculosis. Mary F. Nannetti.—p. 22.

Indian Medical Gazette, Calcutta

67: 601-660 (Nov.) 1932

Influence of Diet on Pregnancy and Early Infant Mortality in India. Margaret I. Balfour and S. K. Talpade.—p. 601.
*New Conception in Treatment of Puerperal Sepsis: Interim Report on Value of Vitamin A. A. L. Mudaliar and C. K. Menon.—p. 606.
Inversion of Uterus: Report of Eight Cases with Comments on Treatment. K. Das.—p. 609.
*Hexylresorcinol as an Anthelmintic. P. A. Maplestone and A. K. Mukerji.—p. 610.
*Sulphur Treatment in Mental Diseases: Experimental Study of One Hundred Cases. J. E. Dhunjibhoy.—p. 612.
Treatment and Prophylaxis of Dracontiasis. V. N. Moorthy.—p. 617.
New Vegetable Culture Medium Made from Papain Digest of Mung Dal (Phaseolus Mungo), Green Variety. H. W. Acton, C. L. Pasricha, A. C. Roy and S. M. das Gupta.—p. 619.
Constants of Pure Buffalo Ghi. B. B. Brahmachari.—p. 623.

67: 661-720 (Dec.) 1932

Diagnosis and Treatment of Noncongestive Glaucoma. E. W. O'G. Kirwan.—p. 661.
Treatment of Bacillary Dysentery by Bacteriophage. F. H. McCay.—p. 666.
The Testing of Anthelminthics. P. A. Maplestone.—p. 673.
Dengue Fever in the Rangoon-Mingaladon Area. M. Jafar and B. Singh.—p. 674.
Rôle of Serology in Rabies. S. D. S. Greval.—p. 676.

Puerperal Sepsis.—This being a preliminary report, Mudaliar and Menon do not propose to make any definite statements as to the efficacy of vitamin A therapy in puerperal sepsis. Their experience encourages them in the hope that this type of treatment may be carried on with increasing success. They have observed that the administration of super-D cod liver oil as a prophylactic during pregnancy is exceedingly useful in cases in which a difficult labor may be anticipated. They have given super-D cod liver oil as a prophylactic after labor in cases in which septic complications were likely to arise and it has yielded uniformly good results. The administration of cod liver oil in certain prolonged fevers of the puerperium associated with signs of sepsis has tended to bring down the temperature in a short time. They believe that the morbidity rate and range will be considerably lessened by the use of vitamin A. Of the twenty-five patients in whom this treatment was adopted, and little or nothing else done, their results have been quite satisfactory in twenty-four.

Hexylresorcinol as an Anthelmintic.—In their series of cases, Maplestone and Mukerji followed the recommendations of Lamson and his co-workers regarding regulation of diet, and gave doses of 1 Gm. of hexylresorcinol in hard gelatin capsules. They treated twenty-one cases of ascariasis with a cure rate of 66⅔ per cent, and an egg reduction, estimated by the original Stoll counting method, of 94 per cent. They treated twenty-six cases of hookworm infestation with 7.7 per cent of cures, and 71.4 per cent of egg reduction. In the present instance, as on former occasions, they relied on the examination of the stools by Lane's centrifuge method at least ten days after treatment in testing for complete cure, and, while using the egg-counting method as well, they consider their results by Lane's technic the more valuable of the two. In treating ten cases of Taenia saginata infestation they used the same dose and the same method of administration as in the case of roundworm infestation. In no case did they recover the complete worm, but five of the patients reported that they have been free from passing segments for over three months, four have not been cured, and one could not be traced. These results are not nearly as satisfactory as those reported with carbon tetrachloride by Maplestone and Mukerji. It should also be noted that, although the greater part of a tapeworm was usually evacuated a few hours after treatment with hexylresorcinol, the worms were always alive and moved actively when placed in water.

Sulphur Treatment in Mental Diseases.—In treating 100 patients suffering from various mental diseases, Dhunjibhoy used the technic of sulphur injection originally recommended by Schroeder; viz., injection of the solution supraperiosteally on the lateral side of the femur, preferably between the upper and the middle third. The next best sites are the gluteal regions and the outer sides of the arms when the thighs are contraindicated by any disease condition. From the results he obtained, he states that there can be no doubt that injections of sulphur in olive oil invariably produce a degree of pyrexia, the temperatures ranging from 100.2 F. to 105 F. and the average being 102.1 F., and that the temperatures cannot be

regulated by the doses. Pain at the site of injection in every case was unavoidable but certainly bearable. Sulphur injections should be given unhesitatingly, because unlike malaria therapy they are perfectly safe and can be given to young and old alike. Earlier cases respond better to treatment than the old chronic cases, and the earlier the treatment is instituted the greater is the chance of recovery. The author concludes that sulphur merits a trial in all early cases of psychoneurosis and psychosis and seems definitely useful in chronic psychotic patients who have heretofore failed to respond to other methods of treatment. It also appears to be useful in cases of benign and secondary stupors. Of his 100 patients, 39 improved and 13 recovered completely.

Journal of Tropical Medicine and Hygiene, London

36: 1-16 (Jan. 2) 1933

Intensive Antimonial Treatment of Kala-Azar: II. Urea Stibamine. U. Brahmachari, A. R. Majumder and R. B. De.—p. 1.
Report on Blindness in Wa and Tumu Districts, Gold Coast, West Africa. G. Saunders.—p. 5.
Presence of Microfilaria in Ascitic Serofibrinous Effusion of Patient Infested with Wuchereria Bancrofti: Preliminary Report. H. P. Froes.—p. 6.

Lancet, London

2: 1369-1416 (Dec. 24) 1932

Harelip: Operations for Correction of Secondary Deformities. H. Gillies and T. P. Kilner.—p. 1369.
*Congenital Heart Block. Janet K. Aitken.—p. 1375.
*Incidence of Albumin and Sugar in Urine of Normal Women. G. W. Theobald.—p. 1380.

Congenital Heart Block.—Aitken tabulates the thirty-seven cases of congenital heart block reported in the literature and reports two personally observed cases. The author states that the diagnosis of congenital heart block depends on graphic observations with a history of a slow pulse from an early age, or the absence of a history of any infection that might cause the condition after birth. A large proportion of the cases present other congenital heart abnormalities, the gross pathologic symptoms being associated with these other lesions rather than with the heart block. In three of the reported cases in which there was no other congenital cardiac abnormality the patients were healthy well grown people whose response to exercise was good. The cause of the condition is probably excessive formation of the fibrous tissue which normally develops between the auricle and ventricle, leaving the auriculoventricular bundle as the sole muscular connection between the chambers. The excess of fibrous development interferes with the continuity of the bundle. According to Lewis, there are three chief ways in which heart block may be caused: (1) by directly interfering with the conducting tracts, that is to say, the auriculoventricular node, the bundle or both branches of the latter; (2) by stimulating the vagus, or (3) by introducing toxic bodies into the blood stream. In the case of congenital heart block, the second and third causes can probably be put aside. Even if one could imagine vagal stimulation occurring in utero, the effect is usually transient and would not account for the long standing block noted in most of the congenital cases.

Incidence of Albumin and Sugar in Urine of Normal Women.—Theobald, in examining the urine of women, found albumin in clinical amounts in 26 of 110 college girls, or 23.6 per cent; 843 of 5,042 postoffice girls, or 16.7 per cent, and 75 of 912 charwomen over 25 years of age, or 8.2 per cent, while only 10 of 22 women medical students consistently passed urine that was either free from albumin or contained less than a trace. In the majority of morning specimens examined not a single cast was seen, and on no occasion was more than one granular cast observed. The incidence of albuminuria would not appear to be related to the age of onset of menstruation. Sugar was not detected in clinical amounts in any sample of urine but was frequently found in small amounts in the first urine passed in the morning or in the evening and was least often found in that passed after breakfast or lunch. Twenty-four hour samples of urine are useless for investigating glycosuria or albuminuria, and in the investigation of a case of non-nephritic albuminuria the sample of least value is that passed on arising. Not only is the incidence of albuminuria during the sixth month of pregnancy so low as to demand an explanation, but an existing non-nephritic albuminuria tends to clear up during the early months of pregnancy.

Paris Médical

1: 45-72 (Jan. 21) 1933

Dermatology in 1933. G. Milian and L. Brodier.—p. 45.
*Anthrax Simulated by Venomous Stings. Gougerot and Ragu.—p. 51.
Mercurochrome in Dermatology. J. Gaté and P. Cuilleret.—p. 53.
Recurrent Herpes. L. Périn.—p. 55.
Biotropic Gold Salts. Asdéry.—p. 62.
*Treatment of Lichen Planus by Ultraviolet Rays. Elisabeth Skwirsky.—p. 66.

Anthrax Simulated by Venomous Stings.—Gougerot and Ragu state that the bites of venomous insects may occasionally resemble the cutaneous lesions of anthrax. The anamnesis of a sting, the rapidity of the growth, the soft scab, the ring of vesicles and the painful red edema make it appear identical with anthrax at first, but the absence of general symptoms contradicts this diagnosis and the negative result of bacteriologic examination, the favorable evolution of the disease, without serum therapy or intense local therapy, confirms the diagnosis of venomous insect bite and removes the anxiety of the prognosis of anthrax and the need for a painful, unpleasant treatment.

Lichen Planus.—Skwirsky describes the treatment of lichen planus with ultraviolet rays used in the service of Milian. Practically no failures and only exceptional recurrences have been encountered. It is of the utmost importance to give the erythema dose; lesser doses are not only useless but accustom the skin to rays of short wavelength and make it resistant to future applications. Severe painful reactions are rare in persons with lichen planus, and soothing medicaments, which retard cure, are not required; in exceptional cases, simple starch baths may be given. The patient should be carefully examined at each sitting; insolation should not be repeated on a zone still painful from previous insolation. For treatment of generalized lichen planus the body is divided into four irradiation zones, which are irradiated successively every other day with the erythema dose. After these four applications of the erythema dose have been given, the irradiations are applied alternately to the anterior and the posterior surface of the body in periods gradually increased to forty-five minutes. The lamp should be at a distance of 60 cm. The irradiations should be continued till the eruptions have disappeared completely; twelve applications in the average case, and from fifteen to twenty in the resistant case usually suffice. Localized lichen planus is best treated by a lamp for local irradiation in which the rays come through an adjustable orifice which permits regulating the field of irradiation to the desired shape and size. Two irradiations of ten minutes at a distance of 10 cm. are given two days apart. Thereafter irradiations are given every other day, with the periods increased ten minutes each time up to a total of forty-five minutes and with the lamp at a distance of 60 cm. For the treatment of buccal lichen planus a special compressor composed of a quartz cylinder 2 cm. in diameter and 20 cm. long, curved at the distal end, is attached to the local irradiation lamp in a manner that permits rotation in all directions. In the first irradiation the tolerance of the patient is determined. The second irradiation is started by applying the end of the compressor directly to the lesion and compressing it for two minutes; this is followed by irradiation for six minutes with the end of the compressor 1 cm. from the lesion. The applications of compression and irradiation are given every other day with gradual increase up to fifteen minutes for posterior lesions and twenty minutes for anterior lesions. Lingual lesions may be irradiated longer if the throat can be protected.

Presse Médicale, Paris

41: 113-136 (Jan. 21) 1933

*Treatment of Diabetes by Insulin in Oil. M. Labbé, R. Boulin and Daunois.—p. 113.
Cutaneous Allergy in Pathogenesis of Vesiculo-Edematous Arsenical Erythrodermia. A. Sézary and G. Mauric.—p. 115.
*New Method of Vaccination by "Anabacteria." R. Legroux.—p. 118.
*Rare Manifestation of Alimentary Anaphylaxis. A. Haritantis.—p. 119.

Treatment of Diabetes by Insulin in Oil.—Labbé and his associates have experimented with oily suspensions of insulin in the treatment of diabetes. In view of the fact that the injections are complicated, that it is doubtful whether the tissues can endure the penetration of the substances contained in these preparations for a lifetime, and that there is no proof that large amounts of insulin are not stored and may penetrate the circulation suddenly and provoke severe accidents, the authors think

that it is better to continue using the aqueous preparations of insulin pending further research with the oily preparations.

Vaccination by "Anabacteria."—Legroux applies the term "anabacteria" to a formalized autolysate obtained from macerated aqueous bacterial suspensions. With anabacteria obtained from Bacillus mallei and B. pestis he has successfully vaccinated guinea-pigs against glanders and plague, respectively. With the anabacteria of B. mallei he has cured glanders in guinea-pigs and has produced an antibacterial horse serum which effectively immunized donkeys against glanders.

Alimentary Anaphylaxis.—Haritantis reports a case of alimentary anaphylaxis that lacked the classic clinical symptoms of anaphylaxis. The principal clinical symptoms were an intermittent daily fever, which had lasted for three months, and gross hepatic hypertrophy. A slight leukopenia after meals and a periodic, temporary erythema of the scalp were the only suggestions of a possible alimentary anaphylaxis. An albumin free diet resulted in complete apyrexia and a considerable decrease in the size of the liver in six days. The production of a typical hemoclastic crisis by administration of an albuminous meal (milk) to the fasting patient after eleven days of an albumin free diet showed that the proteopexic function of the liver was impaired; various tests could discover no other hepatic insufficiency. The sensitization to albumins was further confirmed by cutaneous reaction and tachyphylaxis. A third experiment consisted in administration of a light albuminous meal after twenty days of a vegetable diet, during which period the patient had been apyretic. This meal produced not only a hemoclastic shock but a fever, thereby definitely confirming the anaphylactic nature of the patient's fever. Desensitization was accomplished in one month by combined oral and parenteral administration of peptone solutions. The author thinks the alimentary anaphylaxis in this case was probably the cause of the symmetrical hepatomegalia as well as the fever, rather than the result of the hepatic disturbance.

Diagnostica e Tecnica di Laboratorio, Naples

3: 829-924 (Oct. 25) 1932

*New Method of Diagnosis of Hepatic Diseases by Means of Hemoclastic Crisis. L. Jacchia.—p. 829.
Is Antigen Indispensable in Deviation of Complement Test for Syphilis? V. Pennati and U. Sbutega.—p. 854.

Hemoclastic Crisis in Diagnosis of Hepatic Diseases.—Jacchia has observed that an injection of 2 cc. of liver extract in the median cubital vein or the gluteal muscles of patients suffering from diseases of the liver occasions a hemoclastic crisis. The author obtained sixteen positive results while experimenting with seventeen patients, and ten negative results in ten persons with normal livers. Results were negative in four tests performed with intravenous injections of 1 cc. of a mixture of chiniofon and casein. In cases giving a positive reaction, the extract brought about a definite leukopenia with diminution of the leukocytes varying from 1,000 to 4,000 cells per cubic millimeter. The leukopenia was proportionate to the quantity of extract injected. Two hours after intravenous injection, a leukocytosis developed in contrast to the leukopenia. The leukopenia was often accompanied by a relative lymphocytosis, developed at the expense of the polymorphonuclear neutrophils. This lymphocytosis diminished but did not disappear two hours after the injection. In all cases there was a slight fall of the arterial pressure but within restricted limits (between 5 and 15 mm. mercurcy), and a rise in pressure was never observed after the injection. The variations in the arterial pressure lasted two hours. In a patient with simple catarrhal jaundice, the extract occasioned a striking leukopenic reaction (diminution of 2,790 leukocytes) without lymphocytosis, and a slight drop in arterial pressure during the acute phase of the disease; during convalescence, some twenty-five days later, another injection of the same extract gave a negative result, producing a leukocytosis (increase of 1,240 leukocytes after half an hour and 1,550 after two hours) instead of a leukopenia, did not modify in any way the leukocytic formula, and only slightly increased the arterial pressure half an hour after the injection. The author found that the maximum intensity of the reaction was reached half an hour after the intravenous injection and one hour after the intramuscular injection. He believes this was caused by anaphylactic phenomena brought on by protein substances. He plans further experiments to clear up this point.

Policlinico, Rome

40: 1-64 (Jan. 15) 1933. Surgical Section

*Resections of Epididymis Followed by Implantation of Vas Deferens in Testis. V. Alberti.—p. 1.
Postoperative Pulmonary Complications. G. Baggio.—p. 14.
Transplantation of Spontaneous Rat Sarcoma by Means of Intravenous Injection of Tumoral Pulp. G. Gucci.—p. 22.
*Gastric Hemorrhages of Obscure Origin. G. Pupini.—p. 31.
Malignant Renal Tumors of Infants. S. Scandurra.—p. 50.

Resection of Epididymis.—Alberti reviews the literature of the pathologic lesions of the epididymis with especial attention to tuberculosis of the testis and to nonspecific and fibrous epididymitis. He reports six cases with extensive resection of the head of the epididymis followed by immediate reimplantation of the vas and accurate covering up, by means of interrupted catgut sutures, of the epididymal or deferential flap with the testis and consequent reconstruction of the external layers. The clinical results were deemed entirely satisfactory.

Gastric Hemorrhages.—Pupini describes a case of parenchymatous gastrorrhagia of probable inflammatory origin (hemorrhagic gastritis) of six years' duration and refers incidentally to two other patients, observed for a number of years, with nonulcerous gastric hemorrhages. The author states that the diagnosis of gastrorrhagia of nonulcerative origin due to primary lesions of the stomach and not ascribable to local or general extragastric diseases is extremely difficult and should be made only by exclusion. These hemorrhages can be caused by circumscribed lesions (aneurysms, primary but not miliary varicose veins), by diffuse lesions of the gastric wall (arteriosclerosis, syphilis, amyloid degeneration of the blood vessels), or by obscure etiologic alterations of the mucosa of the stomach (gastritis). The author maintains that it will always be impossible to differentiate between them clinically and that they should be called parenchymatous hemorrhages due to diffuse alterations of the wall of the stomach. The author deems it best to operate only in cases unresponsive to medical treatment. In many cases extensive gastric resections do not always give sure results, whereas gastro-enterostomy often does. The author states in conclusion that prolonged postoperative, medical, dietetic and climatic treatment (transfusions of solutions of calcium salts, high mountain climate and so on), is of palliative value.

Riforma Medica, Naples

49: 77-116 (Jan. 21) 1933

Extrarenal Component of Nephritis Hyposthenuria. F. Serio.—p. 86.
*Inconveniences of Acridinic Treatment and Ungual Alteration Due to Acriflavine Hydrochloride. L. Ciarrocchi.—p. 91.
Postoperative Peptic Ulcer Ending in Gastric Fistula. L. Rieppi.—p. 107.

Inconveniences of Acridinic Treatment and Ungual Alteration Due to Acriflavine Hydrochloride.—Ciarrocchi discusses the disturbances resulting from the intravenous injection of acridine yellow derivatives. He cites the following as immediate disturbances recorded in the literature: sensations of heat at the face, neck and genitalia, tachycardia, bradycardia, olfactory paresthesia, facial congestion, constriction at the neck, sensation of precordial weight, nausea followed by biliary and alimentary vomiting, cephalea and vertigo. He gives as late disturbances gastralgia, alimentary vomiting, diarrhea, primary acridinic jaundice, fever, frequent and painful micturition, acute nephritis, arthritis, yellowish cutaneous discoloration and erythema. He states that the immediate disturbances occur in most patients after the first injection of acridine and that the late manifestations occur rarely. To these he adds now a leukonychia of the thumbs found in two patients treated with an intravenous injection of 5 cc. of a 20 per cent solution of acriflavine hydrochloride. One patient, whose hands had been exposed to the sun on an average of three hours daily, developed an immediate total white discoloration of the ungual lamina; the other, who had been less exposed to the sun, developed only a partial leukonychia six weeks after the injection. The author has reviewed a large number of clinical cases treated with acridine and found that the late disturbances seldom occurred unless the patient had previous hepatic or renal alterations. He has found but one fatal case, a patient with gradual endocarditis who, six days before death, had been given an intravenous injection of 20 cc. of a 1 per cent solution of acriflavine hydrochloride. He concludes that acridine derivatives rarely cause serious dis-

turbances and are in general successfully administered in most diseases such as pneumonia, meningitis, endocarditis, streptococcic and staphylococcic septicemia, epidemic encephalitis, acute articular rheumatism, pyelonephritis and chronic urticaria.

Archiv für Verdauungs-Krankheiten, Berlin

53: 1-144 (Jan.) 1933

Is Dark-Brown Bile (B Bile) Always Bile from Gallbladder? M. Einhorn.—p. 1.
Analysis of Icterus Gravis. P. A. Barchasch.—p. 9.
Chronic Intermittent Duodenal Stasis. J. Friedenwald and M. Feldman.—p. 20.
Typical Changes in Alimentary Blood Sugar Curve in Allergic Conditions. P. Spiro.—p. 32.
*Coronary Thrombosis and Diabetes. G. Gottsegen.—p. 36.
Lymphogranulomatosis of Stomach. G. Kopstein.—p. 41.
Dependence of Health on Atmospheric-Climatic Influences. W. Amelung.—p. 48.
*Investigations on Secretory Function of Stomach During Night Sleep. N. Henning and L. Norpoth.—p. 64.
Porphyrins and Their Significance in Pathology of Digestion. I. Boas.—p. 87.

Coronary Thrombosis and Diabetes.—Gottsegen describes two cases in which a coronary thrombosis existed simultaneously with disturbances in the carbohydrate metabolism. He considers unjustified the opinion that in the occurrence of these two conditions diabetes is always the causal factor. Just as diabetes, which frequently is congenitally combined with arteriosclerosis, may further the development of the latter and thus cause changes in the coronary vessels, so coronary thrombosis in the presence of generalized arteriosclerosis may cause various disturbances in the sugar metabolism, from transitory glycosuria to diabetes.

Gastric Secretion During Sleep.—Henning and Norpoth studied the gastric secretion of ninety-one sleeping persons, some healthy and some with gastric disturbances. They found that in healthy persons the secretory function rested completely during the entire period of nightly sleep. In a great number of patients with gastric disorders, largely duodenal ulcer, maximal secretion of gastric glands was observed, but a continuous secretion during the nightly sleep was observed also in cases of chronic hypertrophic gastritis and in some persons who, although they were free from gastric complaints, showed signs of sympathetic neurosis. In a number of these patients it was possible to demonstrate continuous gastric secretion during the nightly sleep over longer periods. The authors discuss the significance of their observations for the pathogenesis of ulcer and the pains produced by ulcer. They think that the described method is the only one that gives a true picture of the gastric secretion, because it eliminates disturbing, psychic influences.

Deutsche medizinische Wochenschrift, Berlin

59: 119-156 (Jan. 27) 1933

Agony and Death in Early Nursling Age. A. Peiper.—p. 119.
Observations and Investigations on Haff Disease in 1932. H. Assmann, H. Bielenstein, H. Habs and B. zu Jeddeloh.—p. 122.
*Porphyrins and Their Significance in Pathology of Digestion. I. Boas.—p. 126.
Delimitation of Heart and Percussion. E. Mosler.—p. 128.
Artificial Stiffening of Mediastinum. H. Polano.—p. 130.
Demonstration of Tumor Cells in Punctates and in Sputum. E. von Zalka.—p. 132.
Hemorrhagic Meningitis Following Sunstroke. G. A. Hoppe.—p. 133.
Behavior of Skin Capillaries in Exophthalmic Goiter. M. Michael and W. Buschke.—p. 134.
Influence of Liver Extracts on Course of Phenylhydrazine Anemia. E. Friedländer and E. Steinits.—p. 135.

Porphyrins in Pathology of Digestion.—Boas has investigated the stercoporphyrins as well as the porphyrins found in the urine. In discussing the stercoporphyrins he gives especial attention to the diagnostic significance of deuteroporphyrin. This porphyrin has a clinical diagnostic significance for those rare cases of carcinoma of the esophagus, stomach or intestine in which the stools show no peroxidase reactions. But deuteroporphyrin is of greater clinical significance in ulcers of the stomach and the duodenum and in peptic jejunal ulcers. In ulcers with positive blood reactions, the disappearance of deuteroporphyrin and not the cessation of the reactions indicates that the ulcer reaches the stage of cicatrization. In ulcers that give a negative blood reaction, the repeated demonstration of porphyrin indicates the presence of an uncicatrized peptic defect. A constantly negative deuteroporphyrin test, provided the blood reaction is likewise negative, positive roentgenologic signs notwithstanding, indicates a cicatrized ulcer, eventually complicated by a chronic gastritis. The deuteroporphyrin test is of significance also for the therapy in that an ulcer cannot be considered cured until it gives a negative result. The author investigated the occurrence of porphyrin in the urine primarily in biliary and in hepatic disorders. He emphasizes that it is necessary to differentiate between periodic and chronic porphyrinuria. The periodic form occurs in disorders that take a cyclic course. It was observed in cholecystopathies and in hepatopathies during the period of acute inflammation, and also following severe hematemesis or melena. The author observed chronic porphyrinuria particularly in metastatic carcinoma of the liver and in carcinoma of the gallbladder, but also in untreated cases of pernicious anemia. Coproporphyrin was the form most often found in porphyrinuria, but in a few instances another form was detected, which indicates that protoporphyrin may likewise occur in the urine. The author points out that methods combining simplicity and exactness are still lacking for the determination of porphyrins in the feces and in the urine. He realizes that for the stercoporphyrins this will hardly be possible, but he thinks that efforts should be made to improve the methods for the determination of porphyrins in the urine.

Klinische Wochenschrift, Berlin

12: 129-168 (Jan. 28) 1933. Partial Index

Sleep: Aspects and Mechanism. W. R. Hess.—p. 129.
*Pain in Angina Pectoris. S. Dietrich and H. Schwiegk.—p. 135.
Blood Perfusion and Energy Exchange of Kidney. H. Glaser, D. Laszlo and A. Schürmeyer.—p. 138.
Modification of Growth of Micro-Organisms by Irradiation with Short Wavelengths. P. Liebesny, H. Wertheim and H. Scholz.—p. 141.
Effect of Implantation of Hypophysis Under Various Conditions. F. Siegert.—p. 145.
*Quantitative Determination of Porphyrin in Urine. H. T. Schreus and C. Carrié.—p. 146.
Intraperitoneal Injection of Mersalyl. K. Hartl.—p. 148.
Chemical and Secretory Changes in Bile Under Influence of Thyroxine. S. Leites and R. Isabolinskaja.—p. 149.

Pain in Angina Pectoris.—Following introductory remarks about former theories on the pathogenesis of pain in angina pectoris, Dietrich and Schwiegk relate their own observations, particularly their electrocardiographic studies during oxygen deficiency. These revealed that want of oxygen produces changes in the electrocardiogram of healthy persons, and that similar but more pronounced electrocardiographic changes were noted in patients who are subject to attacks of angina pectoris. Development of pains similar to those of a spontaneous attack was also observed during oxygen deficiency of patients subject to angina pectoris. The authors think that during an attack of angina pectoris there exists an ischemia of the cardiac muscle and that not only the changes in the electrocardiogram but also the pains are a result of this ischemia. They consider it improbable that in addition to the oxygen deficiency there also exists a spasm of the coronary arteries, because as long as anoxemia persists it is impossible to counteract the pain by administration of glyceryl trinitrate. The authors hope that their method of deficient oxygen respiration will help also in differentiating various forms of angina pectoris, which would be important not only for the prognosis but also for the therapy.

Quantitative Determination of Porphyrin in Urine.—Schreus and Carrié, after evaluating three other methods for the determination of porphyrin in the urine, namely, weighing, the fluorescence method and the colorimetric method, describe their experiences with the spectrocolorimetric method. The quantitative determination of porphyrin by means of the spectroscopic method is based on the observation that the intensity of the absorption band of porphyrin solutions is proportional to their porphyrin content. Thus, if the absorption band of solutions of known porphyrin content is compared in the spectroscope with that of solutions of unknown content, the porphyrin content of the latter can be readily detected. After a short review of the technic, which has been described in a previous publication (*Klin. Wchschr.* **10:**1017 [May 30] 1931), the authors discuss sources of error that may develop in the separation of coproporphyrin. Then they discuss the application of the method in the determination of uroporphyrin, and certain technical points that may be helpful in some instances. They emphasize that the spectrocolorimetric determination of porphyrin fulfils all the requirements of a clinical quantitative method of demonstration.

Münchener medizinische Wochenschrift, Munich

80: 125-164 (Jan. 27) 1933

Kallikrein (Circulatory Hormone Produced in Pancreas) in Blood. E. K. Frey.—p. 125.
Diagnostic Evaluation of Blood Culture According to Löwenstein in Experimental Tuberculosis of Guinea-Pigs. P. Manteufel and E. Kottmann.—p. 126.
Measures to Induce Labor. F. H. Bardenheuer.—p. 127.
*Sodium Salt of Barbituric Acid Derivative a New Substance for General Anesthesia by Intravenous Injection. M. Ernst.—p. 128.
Retrobulbar Neuritis. F. Schieck.—p. 130.
Ascending Forms of Nephritis. R. Schoen.—p. 132.
Method for Demonstration of Allergy. E. Urbach.—p. 134.
Female Genital Function and Record Accomplishments in Athletics. H. Küstner.—p. 137.
Roentgenologic Diagnosis of Tumorous Bone Diseases. R. Kienböck.—p. 140.
Experiences with Hip Joint Bandage. G. Hohmann.—p. 144.
Fractures of Spinous Processes and Their Peculiar Causes. Bofinger.—p. 146.
Healing Processes After Vertebral Fractures. O. Dyes.—p. 147.
Magnesium Oxide Externally and Internally in Ichthyosis. A. Cedercreutz.—p. 149.

Sodium Salt of Barbituric Acid Derivative as New Anesthetic.—Ernst points out that, although the methods of general anesthesia applicable in clinics and hospitals have been greatly improved in recent years, the physician in general practice, particularly in emergency surgery, was still at a disadvantage. Recently a sodium salt of a barbituric acid derivative has been prepared and found to produce a satisfactory short general anesthesia. Tests revealed that the intravenous injection of 10 cc. of a 10 per cent aqueous solution of the sodium salt is the best method of application. The injection should be made slowly and cautiously. The author advises injecting the first 4 cc. within the first minute, and then taking from eight to ten seconds for each additional cubic centimeter. The injection is entirely painless. The duration of the anesthesia varies in different persons and according to the quantity of anesthetic injected. The average length is from fifteen to twenty minutes, but occasionally longer. This period, during which the reflexes are abolished, is followed by a quiet but shallow sleep of variable length. Self observations of several physicians, who had experienced several types of anesthesia, were to the effect that this anesthetic is more pleasant to take than any other. The harmlessness of this method of anesthesia is proved by the fact that there occurred not a single serious complication in 250 administrations. Secondary effects were observed only in a few instances: headaches twice, nausea three times, diplopia once and excitability twice. These slight disadvantages are more than compensated by the advantages. The fact that this anesthetic exerts little influence on circulation and respiration makes its use advisable in old persons and in those with impaired cardiac action. In diseases of the respiratory passages its use is less dangerous than that of the usual inhalation anesthetics or tribrom-ethanol. Diseases of the liver and of the kidney are no contraindication to the use of the sodium salt of the barbituric acid derivative, and the possibility of repeated application is another advantage of the preparation. The author employed the new method of anesthesia most frequently in pyogenic infections, phlegmons, abscesses, opening of pleural empyemas, and various other surgical interventions in which local anesthesia is less satisfactory, such as in reposition of dislocations and fractures of the joints.

Wiener klinische Wochenschrift, Vienna

46: 97-128 (Jan. 27) 1933

*Causes of Renal Insufficiency Produced by Retention of Urine: Their Significance for Surgery of Prostate. H. Rubritius.—p. 97.
Results in Four Hundred Meniscus Operations. F. Mandl.—p. 102.
Diagnostic Errors in Endocrinology. M. Breitmann.—p. 103.
*Chemical Diagnosis of Malignant Tumors (Cancer Reaction of Fuchs). H. J. Fuchs and W. K. Devrient.—p. 108.
*Peculiar Effects of Parathyroid Extract: Action on Varicose Ulcer of Leg and on Alveolar Pyorrhea. Anna Sucher.—p. 109.
*Rectal Diathermy in Gynecologic Disorders of Inflammatory Nature. B. von Bodò.—p. 110.
Symptoms and Treatment of Several Forms of Poisoning. H. Schlesinger.—p. 112.
Whooping Cough. R. Neurath.—p. 113.
Quinine Therapy of Pneumonia. M. Weinberger.—p. 114.

Renal Insufficiency Produced by Retention of Urine.—In discussing the causal factors of urinary retention, Rubritius calls attention to studies made by Fuchs which revealed that complete evacuation of the bladder is accompanied by a contraction of the upper urinary passages, whereas gradual filling of the bladder results in a dilatation of the upper urinary passages. This author was able to show also that the condition was not due to mechanical stasis but rather to a reflex action. This reflex is evidently produced by dilatation and burdening of the vesical fundus. Elimination urography in patients with hypertrophy of the prostate convinced Rubritius that in the beginning stages of prostatic hypertrophy the contraction and dilatation of the ureters is promptly elicitable, whereas in patients with retention of urine the upper urinary passages show nearly always a dilatation; that is, the dilated condition has become more or less fixed. Moreover, this dilatation is accompanied by an hypertrophy of the ureteral musculature. The author discusses the effect of these changes in the upper urinary passages on the renal parenchyma, and the second causal factor of urinary retention; namely, the vesico-ureteral reflux. It is important whether the vesico-ureteral reflux takes place while the urine is clear; that is, in a patient without infection, or in a patient in whom infection is present. If infection exists, reflux may lead to a serious infection of the renal parenchyma. The author shows that operative treatment of prostatic hypertrophy has a prospect of success only if an existing renal insufficiency, no matter whether it is caused by retention or by infection, can be brought to regress. Since the symptoms of renal insufficiency are usually too slight to permit a diagnosis, the author recommends the water and concentration test and the determination of the rest nitrogen and of the indican content of the blood serum to determine the condition of the renal function. He considers the water and concentration test particularly valuable. The main factor in overcoming renal insufficiency is to do away with the stasis. In mild cases this is best done by the retention catheter, and in severe cases by a suprapubic fistula. The author shows that age is no contraindication to operative treatment and maintains that a prostatectomy under local anesthesia is well tolerated by octogenarians. It is essential for the success of an operative intervention that it be performed before a serious renal insufficiency has developed.

Chemical Diagnosis of Malignant Tumors.—Fuchs and Devrient call attention again (see abstracts in THE JOURNAL, Dec. 3, 1932, p. 1990, and Dec. 31, 1932, p. 2300) to the cancer reaction devised by Fuchs several years ago. They emphasize that with this method it is possible to detect the presence of malignant tumors or of certain infectious diseases, and that the test also reveals the relationship between the aggressiveness of the disease and the defense power of the organism.

Action of Parathyroid Extract on Ulcer of Leg and on Alveolar Pyorrhea.—Sucher states that the favorable effects of parathyroid hormone in angioneurotic conditions induced her to continue her experiments in this direction and to try it in the treatment of persistent ulcers of the leg. By means of a syringe, 1 cc. of parathyroid extract, otherwise used for injection, is dropped on the ulcer and the ulceration is covered with dry sterile gauze. The extract is applied three times each week or every day. This external application is combined with internal administration of a calcium preparation. The result of the application of the parathyroid extract is that a torpid ulcer becomes hyperemic, granulation sets in, and finally complete cure is effected. Local application of the parathyroid extract was also tried in alveolar pyorrhea. The result was that the inflammatory manifestations and pains disappeared, but the looseness of the teeth was not influenced.

Rectal Diathermy in Gynecologic Disorders.—According to von Bodò, diathermy is the most effective of the physical methods employed in the treatment of disorders of the female genitalia. Of the three methods of application, percutaneous, vaginal and rectal, the vaginal method is the one that is most frequently employed. However, the author maintains that in certain inflammatory processes of the small pelvis, particularly in inflammation, contraction and rigidity of the sacro-uterine ligaments, the rectal method of application is superior. He found the olive electrode of Kelen to be best suited for rectal diathermy. Rectal application has to be done with great care, because the nearness of the sacrum increases the danger of burning. The increase in heat should be gradual to a maximum of not more than 1.5 amperes. The application lasts from twenty to thirty minutes. The author employed the abdominodorsorectal diathermy in 120 cases. There was posterior parametritis in thirty-five of these cases, retrofixation of the uterus in twenty-five, salpingo-oophoritis in twenty-four, tumor of the

adnexa with posterior parametritis in sixteen, and parametritis of the right or left side and posterior parametritis in twenty. The result was that cure or complete restitution was obtained in 47 per cent of the patients, improvement was noticeable in 45 per cent, and the treatment was entirely ineffective in only 8 per cent. In the course of two years, 12 per cent of the patients had relapses. The author further gives his theory of the mechanism of the diathermy treatment.

Zeitschrift für klinische Medizin, Berlin

123: 1-302 (Jan. 17) 1933. Partial Index

Iminazol Derivatives in Deproteinized Blood and in Other Body Fluids (Transudates and Exudates). F. Kauffmann and W. Schulz.—p. 1.
Demonstration of Epinephrine Secretion in Human Beings. F. Brandt and G. Katz.—p. 23.
Clinical Aspects of Infantilism. C. Mandowsky.—p. 51.
Influence of Organ Extracts on Hemolysis with Especial Consideration of Liver Extracts. L. Pincus.—p. 55.
Observations in Heart Ruptures (Also Contribution to Problem of Angina Pectoris). R. Jaffé and K. Bross.—p. 63.
*Clinical Significance of Notched Auricular Wave in Electrocardiogram. G. Spehr.—p. 85.
Demonstration in Blood of Substances Increasing Capillary Permeability Following Roentgen Irradiation. A. Beutel and O. Klein.—p. 104.
Physiology of Kidneys. G. von Farkas.—p. 111.
*Gastritis and Genesis of Gastric Ulcer: Infection of Upper Intestinal Tract by Yeasts. A. Meyer.—p. 125.
Position of Rheumatic Nodosis in Course of Rheumatic Infection. A. Meyer.—p. 142.
Epinephrine Content of Peripheral Human Blood in Muscular Exertion. G. Katz.—p. 154.
Mechanism of Antagonistic Action of Epinephrine and Insulin. W. Scheer.—p. 159.
Diagnosis of Vascular Function. J. Plesch.—p. 168.
Epidemiology, Clinic and Therapy of Diphtheria. F. Reiche.—p. 211.
*Biglandular Endocrine Disease (Thyrosuprarenal Type According to M. B. Schmidt) with Aspects of Acute Addison's Disease. R. Klingner.—p. 242.

Notched Auricular Wave.—Spehr states that in 4,000 electrocardiographic investigations on persons with and without circulatory disturbances he observed 180 cases with notching of the auricular wave. Continuous tests revealed that the symptom may be constant or periodic. It was found seventeen times in patients without circulatory disorders, but all these patients had a sympathetic neurosis. As a rule, notching of the P wave was found in patients with circulatory disorders. But the circulatory condition is not an important factor, for most of these patients showed a well compensated circulation. A slight increase in incidence was noted in insufficiency of the left with good functioning of the right heart. In the majority of cases that came up for postmortem examination a myocardial impairment of the auricles could be noted, but in some instances macroscopic examination revealed no anomalies. On the other hand, it is known that numerous cases of myocarditis of the auricles do not show notching of the auricular wave. Consequently the author assumes that the notched wave becomes manifest only if certain channels of the auricles are impaired by organic or functional disturbances. The author does not consider the notched auricular wave merely a variation within the sphere of normality, as has been done by others. The organic causes of the notched P wave can be differentiated into degenerative and inflammatory myocardial changes. In the degenerative forms, primarily coronary sclerosis and chronic disorders of the cardiac muscle, repeated examination revealed notching to be a constant anomaly. In acute inflammatory myocarditis that nearly always concurs with infections and particularly rheumatic diseases, the notched P wave is an early symptom of myocarditis but it usually disappears again. Cases of rheumatic myocarditis and endocarditis, in which the notching of the P wave does not disappear or even increases after the acute manifestations have subsided, have an unfavorable prognosis. It was observed repeatedly that the increase in notching was accompanied by a decompensation in the form of mitralization. The notching of the P wave is also frequently noted before the development of absolute arrhythmia. The author considers the occurrence of notching of the P wave during sympathetic neurosis the result of a disturbance in the innervation of the heart, which in turn affects the conduction system or the blood supply of the heart, for as a rule these patients also have bradycardia and prolonged conduction time.

Gastritis and Genesis of Gastric Ulcer.—Meyer shows that the term gastritis is often used in a rather vague manner, and he advises that the diagnosis of gastritis should be based only on definite signs. As such he considers the leukocyte content of the secretion of the fasting stomach and the bacteriologic observations on the gastric and duodenal juices. Acute gastritis and fermentation dyspepsia can be produced by relative insufficiency of the digestive organs, but the infectious factor seems to be of greater significance. An important cause of chronic gastritis is Monilia albicans, and peptic ulcer that frequently develops from chronic gastritis is an infection of the wall of the stomach with Monilia albicans. The author discusses the significance of fungi, particularly yeasts, for enteritis and he gives several case reports to illustrate this.

Biglandular Endocrine Disease with Aspects of Addison's Disease.—Klingner describes the clinical history of a patient who for three weeks showed the symptoms of acute Addison's disease and then, within a few days, died of severe meningitis with encephalomyelitic manifestations. The necropsy revealed that the patient had had a biglandular endocrine disorder of the thyrosuprarenal type. The changes in the suprarenals resembled those that have been observed in Addison's disease and have been designated "cytotoxic contracted suprarenals" with primary destruction of the cortex. The author is inclined to consider that the more or less analogous changes in the thyroid likewise are cytotoxic. He believes that the disease is caused by toxic factors the nature of which is not yet understood. The described case may corroborate the opinion of some authors, who assume that constitutional factors play a part in the pathogenesis of such conditions. The anatomic changes may have existed several years previous to the acute manifestation. The terminal meningitic encephalomyelitic manifestations are most likely of toxic origin, since an anatomic cause was not found. An intercurrent mild form of otitis media evidently was sufficient to produce the severe manifestations that resulted in death. The predominant destruction of the suprarenal cortex with comparatively well preserved medulla may explain the absence of a reduction in the blood sugar content, and the same factor may be responsible for the absent or only slightly developed atypical pigmentation. The nitrogen rest was increased over 100 per cent, but the kidneys revealed no changes that could be considered the cause of this. On the basis of investigations conducted by others the author thinks it possible that the suprarenal cortex influences the nitrogen elimination. The involvement of the thyroid was not indicated by clinical manifestations, and cases of this nature that have been reported before likewise presented the aspects of Addison's disease and showed no symptoms indicative of a myxedema. This explains why there are no records of tests of the basal metabolism or of the iodine content of the blood. The majority of cases that have been reported so far were in women of the menopausal age.

Zeitschrift für urologische Chirurgie, Berlin

36: 167-300 (Jan. 13) 1933. Partial Index

Contributions to Physiology of Secretion of Urine. L. Asher.—p. 167.
Effect of Urine of Renal Tuberculosis Patients on Uterus of Guinea-Pigs Susceptible to Tuberculosis. W. Jadassohn and O. Bucher.—p. 185.
*Lightening the Burden of Patients with Inoperable Prostatic Carcinoma. Kirschner.—p. 191.
Changes in Bladder Result of Amine Dyes. A. Müller.—p. 202.
Observations on Excretory Urography in Renal Tuberculosis. C. Ravasini.—p. 243.
*Restoration of Renal Function Following Removal of Obstructing Lesions. W. Walters.—p. 264.
Unusual Cause of Perinephric Abscess. H. Walthard.—p. 276.
Fungus Disease of Human Kidney. C. Wegelin.—p. 281.

Patients with Inoperable Cancer of Prostate Gland.—Obstruction to voluntary urination can be relieved by establishing a suprapubic bladder fistula. Invasion of the rectum with attending painful tenesmus and partial or complete obstruction of the intestine is treated by establishment of an artificial anus or by sectioning the end of the intestine and dividing the sphincter. Early and severe pains are characteristic of prostatic carcinoma. In the advanced inoperable cases the pain is frequently agonizing and unremitting. Kirschner feels that these unfortunates should be given the benefit of the latest advances in the control of unremitting pain. For this purpose three methods are available: 1. Chordotomy may be employed. The author sections the anterolateral columns of the spinal cord on both sides at the level of the fourth thoracic vertebra. The employment of his so-called high pressure local anesthesia method, together with the use of the electric knife, reduces the bleeding attendant on laminectomy to a minimum. To avoid

pain from the posterior roots, the latter may be injected with a solution of 2 per cent procaine hydrochloride. He was able by this method to afford complete relief to a patient with intractable pain and rectal tenesmus. 2. For patients too weak to undergo a chordotomy, the method of "continued spinal anesthesia" may be employed. With the author's method of "delimited zonal spinal anesthesia," 2 or 3 cc. of a 70 per cent alcohol solution is injected into the dural sac. This method is particularly applicable in cases of pelvic carcinoma of the prostate gland, the rectum, or the female genitalia. Two patients treated by this method were completely relieved of pain. 3. The same result may be obtained by epidural injection of alcohol through the sacral hiatus.

Restoration of Renal Function.—Walters states that the return of renal function after removal of obstructing lesions seems remarkable. Evidence of this is the rapidity with which a distended pelvis will return to within normal limits of size and capacity, and with which renal function improves after complete removal of such obstructions. If one is to attempt to preserve a kidney injured as the result of an obstructing lesion when the opposite kidney is normal, one must have sufficient evidence that such a kidney will return to reasonable function after relief of the obstruction and after control of the infection, rather than to decrease in function and to atrophy. A most important point in such a decision is the remaining amount of renal parenchyma, as measured by the thickness of the cortex and the size of the calices. Even in cases in which a good deal of infection appears to coexist with the obstructing lesion, even in the presence of small cortical abscesses, the kidney may free itself of such infection after relief of the urinary obstruction. In such cases, removal of the fibrous capsule of the kidney, enabling the cortical infection to discharge itself, should be a part of the procedure. In the presence of stones in the kidney and ureter, tests of renal function, such as excretion of phenolsulphonphthalein, indigo carmine and various mediums used in intravenous urography, do not give an accurate index of renal function. Such being the case, whenever sufficient renal parenchyma remains the kidney should not be removed until evidence accumulates after removal of the obstruction that the kidney is not functioning. Indications for conservative procedures, such as resection of the renal pelvis, reimplantation of the ureter or removal of obstructions due to peripelvic tissue, are most strikingly indicated when the hydronephrosis is bilateral, or, if unilateral, when sufficient renal parenchyma remains to justify its preservation. In making the decision as to the best conservative treatment to follow in hydronephrosis, the guide is one's own experience, it being remembered that the safest and best procedure is the one that produces adequate and complete relief of the obstruction, with only disturbance of the renal pelvis or ureteral tissue.

Acta Chirurgica Scandinavica, Stockholm

72: 1-590 (Dec. 14) 1932. Partial Index

*Cause of Napoleon's Death. T. Kalima.—p. 1.
*Studies on Nature of So-Called Prostatic Hypertrophy. A. Krogius. —p. 47.
Gastric Tetany: Studies in Pyloric Stenoses. F. Langenskiöld.—p. 79.
*So-Called Essential Hematuria. O. Löfberg.—p. 161.
Retroperitoneal Tumors. O. Lundblad.—p. 174.
Increase in Mortality from Appendicitis. G. Nyström.—p. 236.
Palliative Resection of Stomach in Certain Cases of Duodenal Ulcer. G. Pallin.—p. 289.
Ileostomy for Mechanical Intestinal Obstruction Following Appendectomy. G. Petrén.—p. 345.
Diseases of Lymph Nodes in Hepatoduodenal Ligament. S. H. Rödén.—p. 392.

Cause of Napoleon's Death.—Kalima states that the general view held among historians and medical men is that Napoleon died of cancer of the stomach. This view is based on the postmortem examination, which showed that the emperor's stomach was the seat of widespread "scirrhous" ulcerations. To the medical reader of today a critical examination of the clinical course of the illness conveys the picture of a gastric ulcer with periodic dyspeptic symptoms, prolonged remissions, increasing anemia (as a result of occult hemorrhage), irritability of the stomach with daily frequent vomiting, severe attacks of pain, and recurring hemorrhage of the stomach. If one adheres to the necropsy diagnosis one faces an insurmountable contradiction between the latter and the clinical picture. A critical examination of the postmortem report shows beyond doubt, however, that the antral part of the emperor's stomach was the seat of a characteristic, funnel-shaped callous ulcer, passing obliquely through the stomach wall, and the floor of which was firmly adherent to the lower surface of the liver. This observation is mentioned casually in the postmortem report, while chief attention is directed to the numerous ulcerations spread over almost the whole of the mucous membrane of the stomach. These ulcerations were looked on as cancerous or as ulcerations in the stage of cancerous degeneration. The clinical picture is definitely against the view that the ulcerations in question were of cancerous nature: in such a case the stomach would have been transformed into a stiff tube without any contractile power. Moreover, no metastases were found at necropsy. On the other hand, by assuming that Napoleon's stomach was the seat of a simple widespread ulcerous gastritis, the anatomic observations can be brought into complete harmony with the clinical picture. This hypothesis finds support in the anatomic investigations of recent years concerning the "gastric" pathogenesis of peptic ulcer. It should be pointed out that ulcer disease was unknown in practical medicine during Napoleon's time. It was through Cruveilhier's investigations, unanimously accepted by medical research of more recent times, that gastric ulcer became a separate clinical entity differentiated from cancer of the stomach.

Prostatic Hypertrophy.—On the basis of histologic studies of normal and hypertrophic prostate glands, Krogius arrives at the following conclusions as to the nature and development of prostatic hypertrophy: The process is not one of tumor formation. It is to be regarded as a hyperplastic regenerative process aiming at the formation of new gland parenchyma to replace that used up in an elderly man, analogous to the regenerative phenomena observed in the prostate under normal conditions. Like the normal regenerative phenomena, the exuberant process leading to prostatic hypertrophy begins in the glandular ducts the epithelium of which retains its ability to form new gland parenchyma until advanced age. Prostatic hypertrophy derives its particular significance from the fact that the hyperplastic process takes place mainly in the middle part of the prostate, developing a steady proliferation of the peritubular connective tissue in the abundant fibromuscular stroma of this region apparently because the young glandular buds require a loose stroma for their growth. In this way there develop small "adenofibromas," which subsequently expand in size and give rise to the localized nodular formations so characteristic of prostatic hypertrophy. The so-called glandless nodules also take their origin from the peritubular layer of connective tissue. The epithelial covering of the newly formed glandular buds soon develops into a mature, secreting epithelium of the apocrine type, which delivers an apparently normal prostate secretion. However, the growth of the nodules results in a compression of the efferent ducts, with the result that in a more advanced stage of the disease the excretory function of the prostate scarcely derives any further benefit from the secretion of the nodules. At the same time, distinct retrogressive changes set in with dilatation and cyst formation. The histologic structure and the entire mode of development of prostatic hypertrophy closely resemble cystic mastopathy.

Essential Hematuria.—Löfberg emphasizes the uncertainty in the diagnosis of so-called essential hematuria as well as the difficulties in selecting the proper surgical procedure. Essential or idiopathic hematuria is characterized by profuse hemorrhages coming from one side in the absence of any recognizable macroscopic lesion. The author points out, however, that even the inspection of a split kidney is not necessarily conclusive, because pathologic changes may be revealed on microscopic examination. Naunyn stated that nephritis was the underlying cause in most cases, though he admitted that a normal kidney may bleed. The author reviews the various theories as to the cause and reports the eight cases observed in the course of ten years at the General Hospital in Malmö (Sweden). A nephrectomy was performed in seven. Interstitial inflammatory changes, believed to be the common cause of essential hematuria, were present in only one case. Thrombosis and embolism were noted in one, and in one case pyelitis granulosa was present. In four cases there were no changes in the parenchyma. Therapeutic indications are vague. Operative intervention is frequently of exploratory nature. Of the various operative procedures, nephrectomy best meets the indications. All of the author's patients were restored to health.